

**Attitudes to Aircraft Annoyance
around Airports (5A)**

FOCUS GROUP REPORT

EEC/ENV/2002/009



Attitudes to Aircraft Annoyance around Airports (5A)

Focus group Report

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EEC/ENV/2002/009

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| Abstract: Eurocontrol have commissioned a pilot project consisting of attitude surveys undertaken around three European airports to determine whether differences in attitude are apparent. The responses given are likely to be varied depending on the affluence, life-style and cultural differences that affect perceptions of disturbance or annoyance arising from aircraft noise in different communities of Europe. These attitude surveys will make major use of stated preference (SP) techniques and focus groups. Survey results should allow better identification of the factors responsible for annoyance. Through experimenting with new noise and emission metrics, better correlation will be sought between these and real annoyance. This report details the results of the initial stage of conducting focus groups in the three countries. | | | | | | |

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BACKGROUND

The benefits of growth and development of the air transport industry can be felt across wide geographic areas in Europe, however the adverse effects of airport operations are primarily borne by the local environment and residents of neighbouring communities situated close to aircraft approach and departure routes.

The general aim of this project is to try to better understand “annoyance” of local residents around airports across Europe by defining and attributing a value to the factors responsible for a deterioration of the quality of life for these households. These factors include noise, local air quality, increased road traffic, etc.

Eurocontrol have commissioned a pilot project consisting of attitude surveys undertaken around three European Airports to determine whether differences in attitude are apparent. The responses given are likely to be varied depending on the affluence, life-style and cultural differences that affect perceptions of disturbance or annoyance arising from aircraft noise in different communities of Europe. These attitude surveys will make major use of stated preference (SP) techniques and focus groups.

Survey results should allow better identification of the factors responsible for annoyance. Through experimenting with new noise and emission metrics, better correlation will be sought between these and real annoyance. A more thorough study is planned for the future, once lessons learned from the pilot have been taken on board.

As part of the project, FaberMaunsell were appointed by Eurocontrol in June 2002 to undertake focus groups in the UK, working closely with ITS (the Institute for Transport Studies) in Leeds who were developing the SP design. Concurrently, focus groups were carried out in France, by Ipsos, and in Romania, by Alma-Ro.

OBJECTIVES

The objective was to carry out five focus groups with a wide range of residents around an airport in each of the three countries, Manchester, (UK), Lyon (France) and Otopeni (Romania). The aim of the focus groups was to identify the attitudes of residents near airports to the environmental aspects of living near airports, and specifically the importance of noise in relation to other aspects. A key aim was to assist ITS with identification of factors that could be incorporated into the design of a stated preference survey to follow, and to test these out as far as possible in the focus groups.

STRUCTURE OF REPORT

This report brings together the results of the groups conducted in each of the three countries. Detailed survey methodology reports have been produced separately for each country; and the aim of this document is to highlight both the common and disparate findings that are of importance to the SP development stage.

Following this introduction, Chapter 2 discusses the samples of respondents in each country and describes the methodology applied in conducting the research. In Chapter 3 we discuss the quality of life issues and in Chapter 4 consider how life near an airport is experienced across the study area. In Chapter 5 awareness of noise and its intrusion is

assessed. In Chapter 6 the trade off scenarios and implications for the design of the SP surveys are discussed. Chapter 7 summarises the results and draws conclusions of the study.

Introduction

Five focus groups were undertaken in each of three European countries between June and August 2002.

Manchester Airport was selected as the study area for the UK groups, largely because of its links to MMU from where expertise has been gained in working with complaints data provided by Manchester Airport.

Lyon St Exupery airport was selected as the study area for the French groups, because it was of a similar size and capacity to Manchester Airport.

Otopeni Airport is Bucharest's airport and one of Romania's largest. However, with hindsight it was felt that this might not have been the best choice because of issues surrounding allocation of living space in the area, from the times of the communist regime.

Study Areas

There are some important differences in the three countries which should be understood so that the results of the groups and the approach taken to the research can be appreciated.

In the survey area selected around Manchester, residential areas tend to be distinctive in that they have narrow characteristics, for example, rich/poor, high/low quality housing. In France this seems to not be the case, with the town and villages surveyed having a more homogeneous population. In Romania, it is the impression that people have less choice of where they live than other parts of Europe, with some being relocated forcibly by the Government. Average incomes for Romanians were quoted as 40 Euros, compared with UK incomes ranging from typically 1000 to 6000 Euros per month and similar in France.

Another difference which may have influenced attitudes to aircraft and associated issues is the response to complaining behaviour that exists in the three locations. In Manchester the airport has a long established and well-developed complaints procedure and aircraft monitoring system. A department is dedicated to dealing with complaints and working with local residents, which although probably not appreciated by many people, does provide a response if a complaint is made. At Lyon Saint Exupery the airport has only recently developed an environmental strategy. Since 1996 the airport has made considerable efforts in terms of regional planning, with the aim of integrating the airport with its environment and avoiding concentrations of people in potentially disadvantaged areas. The airport has recently installed a system enabling the permanent surveillance of noise levels and has adopted various measures to ensure the reduction of air traffic related noise. It is likely that the relative newness of this environmental section means it is still unknown to many people, and hence there was a feeling that complaints were ignored, which probably generates greater levels of ill will towards the airport.

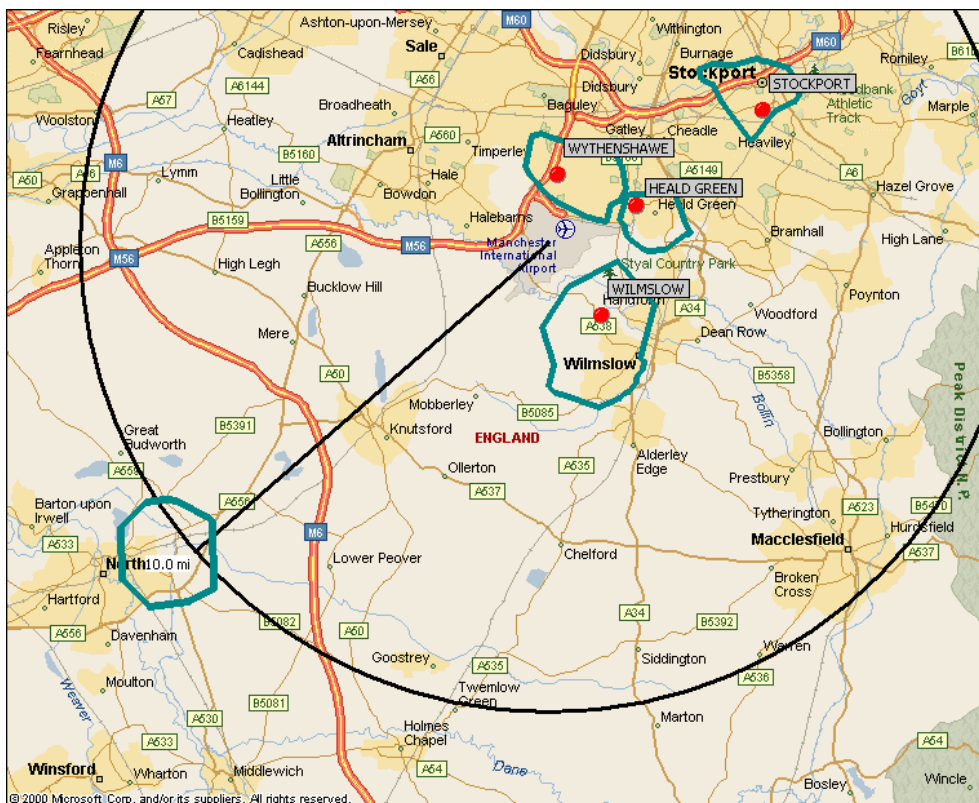
A further difference between the three countries is the level of local democracy and politics. Each French village has a Mayor and council who bring politics into discussions at a much lower level. In the UK interest in local politics is not high, as evinced by the low turn out rates at local elections. In Romania, although a democracy, there appears to be a feeling of resignation that authorities will do as they please and that local people have little power.

Manchester Airport

Manchester Airport is at the south end of the conurbation of Greater Manchester, population around 2.5m. The runways are aligned southwest/northeast (60/240). Areas to the south and east of the airport are relatively sparsely populated, and generally deemed to be desirable, rural locations. To the north and west of the airport, the land is urban for much of the approaching flight path. Five areas were selected with a range of neighbourhood types.

It would have been of interest to have included the rural area to the south west of the runway, but at the request of Manchester Airport, these were excluded.

Figure 2.1 Study Areas - Manchester



Wythenshawe (Woodhouse Park) is an area of mainly low rise council housing, with less well-off families, situated just to the north of the airport site and comprises a relatively high proportion of residents on income support, and is considered one of the poorest areas in England and Wales. A semi detached property here could be bought for around £40,000.

Stockport (Cale Green, Edgeley and Manor Wards) is about 10km from the airport. It is comprised of households of below average incomes. Data suggests these neighbourhoods contain a largely young, blue collar population living in older properties. In this area a typical semi-detached property would sell for around £70,000.

The Northwich area comprised the wards of Lostock Gralam, Rudheath and Witton South covering a wide range of area types, rural, suburban and urban. In terms of affluence the area is mixed but lower than average for England and Wales. House prices are relatively low, with semi-detached properties being available for between £60,000 and £80,000.

Heald Green is a quite well off area located on the periphery of Greater Manchester. House prices would be about the national averages, which means relatively high for the Manchester area, (typically £105,000 for semi-detached property). The area is a typical established home owning area, stable, middle class with low levels of population mobility.

The Wilmslow and Styal areas are high status areas on the suburban/rural fringe of Manchester. A semi-detached property in this area would be in the region of £130,000-£200,000, although many properties here would be detached. The households in the area are relatively wealthy for England and Wales.

Lyon- St Exupery Airport

Lyon airport is situated east of Lyon. The runways are aligned north/south and the area all around the airport is quite sparsely populated. Next to the airport and linking up with it is the TGV (fast intercity train) rail station. As there are projects for the addition of a new runway, a number of consumer rights group have been formed to defend the rights of the local inhabitants. These were deliberately excluded from this study, however, at the Jons group, the President of the organisation "Protection of the Environment in Jons" was present which may have unduly influenced other respondents. All the study areas appear to provide relatively inexpensive housing in an attractive rural location.

St Quentin Fallavier is a small town in a rural setting at 10 km from St Exupery Airport. Whilst not being a very "chic" area to live the town is clearly inhabited by all sorts of social groups. According to the inhabitants who have lived there for a number of years, the town has more than doubled in size over the last ten years leading to a number of changes in terms of road traffic and general atmosphere.

Grenay is a small picturesque village perched on a hillside surrounded by woods at 6.5 km from St Exupery Airport. The village whilst not really up market is very pleasant and is clearly inhabited by all sorts of social groups.

Balan is a small village at 12 km from St Exupery Airport. The inhabitants said little of the village, one even said that it lacked charm, but all the inhabitants were in agreement as to the advantages offered by its environment, and its calm setting in the middle of the countryside. There appears to be a number of recent housing developments and lots for development still available around the village. People are attracted to the village due to the inexpensiveness of the housing.

Jons is quite wide spread and 7.5 km from St Exupery Airport. There is a degree of nostalgia about the rural aspect of the village in previous years. The village has doubled in size over the last fifteen years with a current population of 1,100 people, and has spread quite far from its original centre. According to the older residents Jons has lost some of its original charm and it has left them with the feeling that there is no communal spirit left. All the same, the inhabitants are proud that the village is still very pleasant and pretty to live in.

Pusignan is much more wide spread than the other towns and villages. As a town it has more activities and shops than the others and like them it is close not only to the airport but also to the TGV and the motorway. Geographically it is situated at the foot of the runways, but because of its spread, not all of the people interviewed suffered from the planes flying over their homes. The town is well equipped in shops, medical services, bars, restaurants, and unlike the other local towns there more activities and facilities available for young people and adults. The atmosphere in the town is described as being

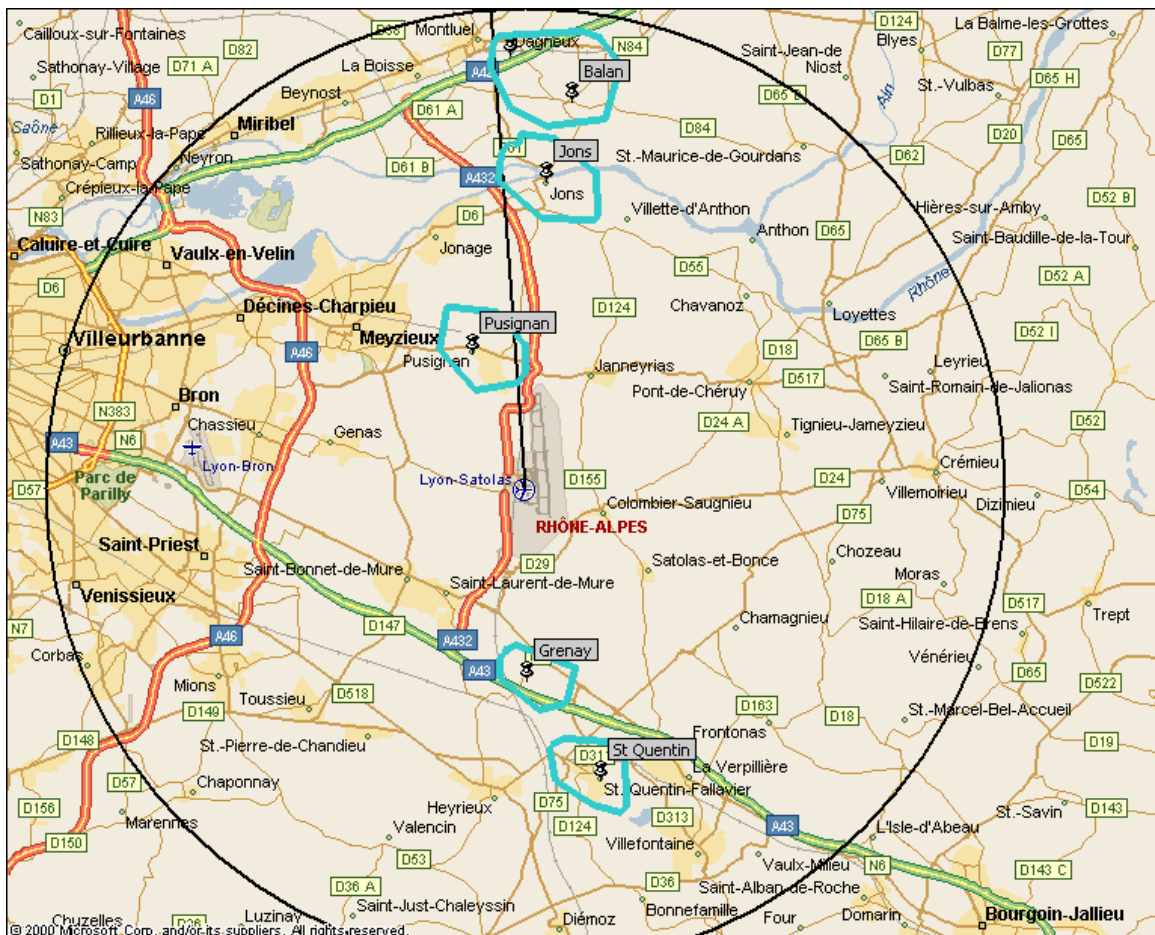
half rural and half urban, with the agricultural roots of the town still clearly apparent despite the fact that there is an industrial park at the edge of the town.

It is important to understand that the towns and villages around the St Exupery airport all have many similar points:

- They are rural communities which have greatly increased in size over the last ten to fifteen years;
- They are relatively small towns and villages which are situated in the middle of a very rural area;
- There are only very slight differences in the social structure and the economic wealth of each of these communities; and
- With the exception of Pusignan, they all suffer from similar local problems such as a lack of local transport, lack of amenities which are inherent to small communities.

This may account for the similar perceptions and reactions to the various aspects covered in the groups.

Figure 2.2 Study Areas - Lyon



Bucharest Otopeni International Airport

Bucharest Otopeni International Airport used to be an air base of the Third Reich (1940 – 1944). It is located 16.5 Km North of Bucharest city and it has two runways aligned 80/260 (approximately East – West). Annually movements are less than 50 000.

The Otopeni area has some specific aspects, as follows:

- Average salary - about 40EURO/month (480 EURO/year);
- Between 1987 and 1989, parts of the villages from the area were demolished by the communist regime and people have been relocated in blocks of flats (Balotesti, Dimieni, Otopeni); after 1990, most of them came back to their land which is their property now;
- In 1995 an aircraft accident happened in Balotesti;
- After 1990 there were large migrations of Bucharest inhabitants to the neighbourhood because of the rural nature of the area (holiday houses; forests & lakes);
- There is a low level of citizens' confidence in authorities.

Otopeni airport is surrounded by the following communities:

- *Dimieni – NE – around 400 inhabitants;
- *Tunari – SE – 3818 inhabitants;
- Otopeni – SW and NW – around 11 000 inhabitants;
- Buftea – W – around 21 000 inhabitants;
- Mogosoaia – W – around 5 000 inhabitants;
- Balotesti – N – 6340 inhabitants.

*Tunari and Dimieni have the same local administration.

Balotesti is a poor village with 6,340 inhabitants and an unemployment rate of 20%. Retired persons represent about 19 % of the local population. Around 40% of the employed population works in services and trade area. During the 70's and 80's many houses were demolished for area systematisation (to gain agricultural land) and reconstruction (blocks of flats were built). It is about 6-7km from the airport on the departure path.

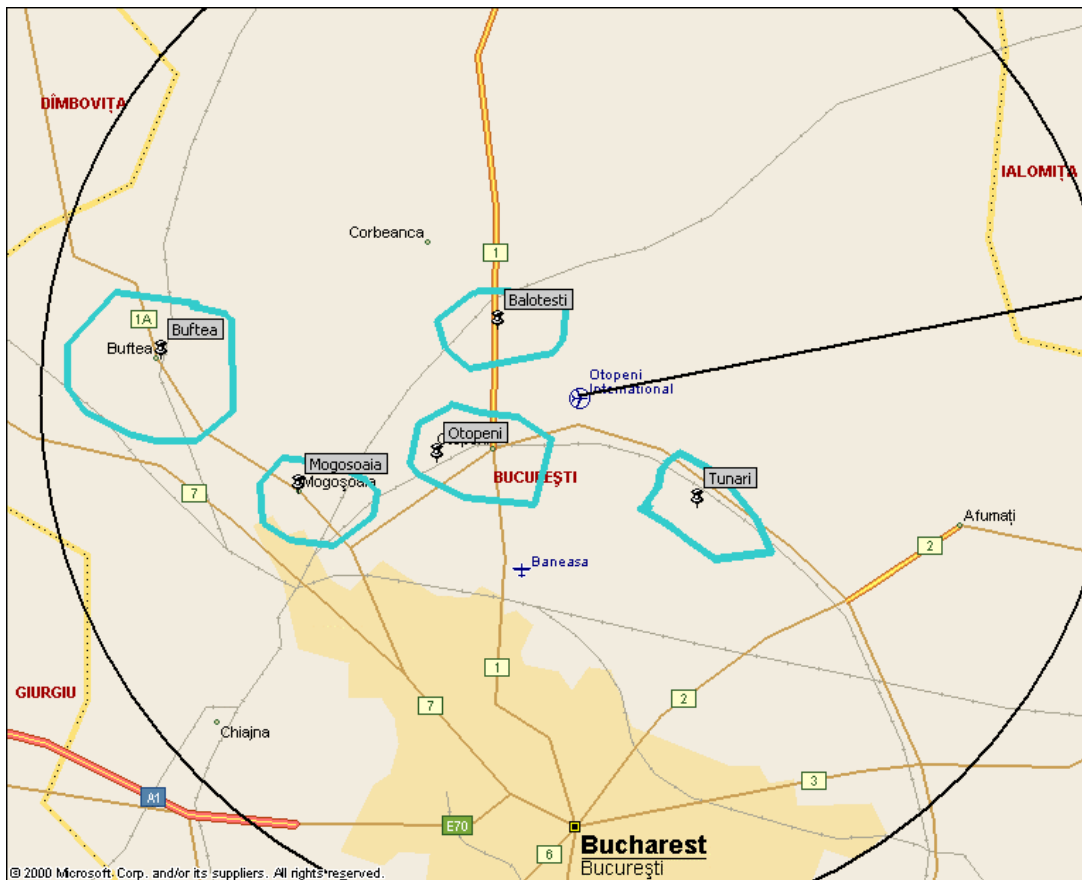
Buftea is a town about 10km from the airport on the flight path, with 21,000 inhabitants of which 22% are retired persons. Women and children represent the majority of the local population (familial abandonment is noticed here). It is in demand for land and houses due to the natural environment (lake, forest etc). About 5% of the existing households are holiday houses .

Mogosoiaia – is a village with around 5,000 inhabitants. 30% of the new buildings in the area are holiday houses. It is 6-7km from the airport on the flight path.

Otopeni – is an urban area with a mixed population (rich and poor), about 11,000 inhabitants, with a percentage of unemployment of 1.3%. Most of population working in the community is involved in sales and services. Only 3% of the active population is working for the airport. The Municipality of Otopeni has a good income, from airport taxes and foreign companies located in the area (for example gas stations, restaurants, supermarket). It is adjacent to the airport.

Tunari and Dimieni are rural areas with a predominant agricultural occupation. Population is estimated at 3,818 inhabitants, with 24% of retired persons. 10% of the active population is working locally in sales and services and 20% work in Bucharest. They are also adjacent to the airport.

Figure 2.3 Study Areas - Bucharest



Focus Group Approach

As far as practicable, the methodology and procedures followed were consistent across all groups in each country.

Recruitment for each group was carried out such that there were mixes of characteristics, for example, in employment, retired, with children etc. Other criteria considered in the recruitment were the length of time at the same address, to include those who have recently made a decision to move to give an understanding of how important location relative to the airport is in deciding where to live.

It is usual in focus group recruitment to exclude personnel within the market research industry (advertising, marketing, public relations or market research), and also anyone working in the sector being researched, as this can bias response. Someone who is very knowledgeable about the topic can adversely influence other participants who may feel unable to challenge the views made. For this reason we excluded anyone working in acoustics, sound engineering or research, but not airport employees. There were no quotas set for airport employees within the groups, that is they were not specifically recruited.

In France, where consumer rights group have been formed to defend the rights of the local inhabitants, members of these were deliberately excluded from this study. However,

in Jons, the president of the organisation: “Protection of the Environment in Jons” present. In the St Quentin group there were anomalies in the recruitment process leading to some self-recruitment through response to an advert and the inclusion of an ex-town councillor who had been contacted because of concern about the environment. While it is understood that because of the relatively high incidence of politically active people in France avoiding these altogether in the focus groups might not have led to a representative sample, their presence may have had an undue influence on the course of the discussion, and this should be borne in mind when considering the responses from these groups.

In Romania, recruitment teams faced some difficulties related to the reluctance of people to disclose information regarding political and administrative aspects, and there was some suspicion about the aim of the project (some thought it might be linked to religious aspects). The group composition was representative of the community. In most of these areas some newcomers are people from Bucharest looking for holiday homes and a natural environment. As they only live there during week-ends, their participation in focus groups was not representative.

All the groups were audio taped and the discussions subsequently transcribed. It was thought that taping might cause difficulties in Romania, but in the end did not prove to be the case.

The first group, in Heald Green was also video recorded, and held in a Viewing Facility, with members of the client group, IPSOS, ALMA-RO, ITS and MMU present behind a one way mirror. This helped ensure a consistent approach.

Noise Simulation

In order to measure the reaction to volume and quality of aircraft noise, use was made of a noise simulation program called ISIS (Interactive Sound Information System), developed by David Dubbink Associates, and provided courtesy of Eurocontrol. This runs on a laptop computer and contains a range of recordings of aircraft and other noise sources. The aircraft can be replayed departing or landing and the decibel level which would be recorded at given distances from the aircraft is shown on the screen.

After listening to the range of aircraft sounds included within the program, five were selected which gave a range of noise types and loudness levels. These, together with the stated maximum decibel levels are shown in Table 2.1 below.

Table 2.1 Aircraft Recordings Tested

| Aircraft type | Movement | DBA |
|---------------|----------|-----|
| B747 400 | Depart | 93 |
| A320 | Depart | 82 |
| B747 400 | Arrive | 97 |
| Lear25 | Depart | 92 |
| B737 | Depart | 80 |

The maximum was shown as 97dBA which was painful to tolerate in the confines of a group venue. The amplifier was therefore calibrated to play back at around 15dBA below these levels when measured with a sound meter.

In practice, the volumes of the recordings varied slightly for each group. It was found that the size of the venue and room acoustics greatly affected the settings for the amplifier, and that sound levels measured were different when the room was full of respondents than for the calibration carried out prior to the group arriving. Other ambient noise sources also affected the readings made with the sound meter, for example, traffic, door slamming.

Discussion Guide

A discussion guide was drawn up listing the topics to be covered in the group discussions. Specific references to airports and aircraft noise were not introduced at the start so that these issues did not dominate other attitudes. The moderator asks open questions that allow the respondents to create answers from their own frame of reference. Leading questions are avoided as these create bias with respondents giving the answers that they believe is required.

The role of the moderator is to facilitate the discussion by ensuring that all participants have opportunities to express their views and that the discussion remains on the research topic. New avenues that may not have been anticipated at the inception of the study should be pursued to provide fresh insights

The presence of other participants means that the atmosphere in focus groups is informal and relaxed. As they listen to the opinions and experiences of others, the participants are able to identify the degree to which what they are hearing fits their situation. By comparing and contrasting the views of others, participants can become more explicit about their own views.

The discussion guide was drafted in consultation with the client group and evolved through the first series of the groups conducted in the UK. The definitive version was then translated into French and Romanian and amended accordingly to suit local situations, for example, in the UK the warm up/lifestyle question asked about recent holidays people had taken; in Romania, this was asked as what choice of holiday would be made if it were a prize in a competition.

The topics included in the discussion are summarised below.

Quality of Life

The discussion began with discussing generally the factors that contribute to 'Quality of Life', to identify the aspects of living that are important and what might be eradicated to improve the quality of life. This led to the importance of home location in affecting quality of life. If airport issues were raised, this was probed to identify how and why, and to what extent.

Where you live

People were then asked to think more about where they lived, and how they might describe the area to someone who would be moving there. This was to encourage them to project their own thoughts on their area and to reveal how they really thought about their home location.

The respondents were then given an exercise, in which they were to imagine they were responsible for a budget to spend on improvements to their local area. They were presented with a list of possible improvements, but with the option of adding additional solutions to the list that were important to them but not listed. Using stickers, the respondents denoted the proportion of their budgets that they would allocate to each improvement. The results were then discussed, and if airport issues arose these were probed further, to identify the relative importance to other environmental aspects of the area.

Living near an Airport

The advantages and disadvantages of living near an airport were discussed. Where noise was raised as an issue, this was put into context by probing for the length of time of living in the area, what measures had been effected to mitigate the noise, and how the person felt about living with the noise.

People were asked whether they had ever made complaints to the airport, and the circumstances involved.

Awareness of Noise and Nuisance

The discussion then moved onto noise and annoyance generally, and the factors that determine annoyance, for example time of day, activity being undertaken, time of year, day of week etc. Tolerance of noise and specifically aircraft noise were discussed.

The respondents then participated in a second exercise. For a range of day types and times of day, respondents were asked to write down activities they would be typically undertaking at those times. Using the ISIS noise simulation program, the recording of the 747-400 departing was played, with a sound level in the room of around 78-90dBA. Respondents were asked how the volume compared to what they would normally hear at home, both inside and outside. Respondents were asked to score on a scale from one to ten how loud they rated the noise, and then how annoying they would find it at different times and days, relating to the activities they had put down. The reactions to the noise and the annoyance was discussed.

The next exercise involved playing the five different aircraft shown in Table 2.1 and asking respondents to score each in terms of loudness and annoyance. They were also asked to think about the type of noise, in terms of its other qualities apart from volume, for example pitch, duration, and write down words that described the noise to them.

Stated Preference (SP) Development

The choices that people would make in trading off different types of aircraft noise were then discussed, testing several options for presentation of variables that are under consideration for the SP design. This aspect of the discussion guide evolved considerably with each group, as the findings from the previous group influenced the approach taken subsequently.

The aim was to see how people might relate to different presentations of variables. One method tested was in relation to personal experience, for example could differences be perceived in day of week, time of day, time of year? Did people understand terms such as 'doubling' aircraft noise, would they prefer fewer noisy aircraft or more, quieter aircraft; at what times of day etc?

Analysis

Following the groups, the audio tapes were transcribed and analysed. The results are presented in subsequent Chapters.

The findings of the discussions are reported for all five groups together, for the key sections of the discussion guide. Quotes from the transcripts are used to support the analysis, and differences and similarities between groups highlighted.

Introduction

The discussion opened with people spontaneously stating what to them contributed towards a good quality of life. At this stage, the respondents had not been made aware of the focus of the discussion as being aircraft noise, and were not aware of the client group except that it was international research involving universities.

Quality of Life

Many of the spontaneous responses were common across all groups.

In Manchester, unprompted responses for factors important for a good quality of life included health, a feeling of financial security and a sufficient disposable income in order to have a 'nice house', being able to afford holidays and eat 'nice food'.

"Health is at the top of the list. Happiness. Friends. Money, Perfect partner, nights out. Good job, Stability, Security, having choice" (Heald Green)

"Free time, home from work. Disposable income, ability to go on holiday. Eating well, health, because if you've not got your health, you can't enjoy life in general, can you." (Northwich)

"The main thing in life is family, and good friends. Being able to work and support your family, having a good hobby, so you're not sat twiddling your thumbs, worrying about the hours going by. If you've got an active job, an active mind, it keeps a healthy body. Nice neighbours where you live. (Stockport)

"Money, a comfortable home. Living in a nice area. A leafy suburb" (Wilmslow)

"Health. Happiness. Money. Good standard of living. Job Satisfaction (Wythenshawe)

Friends, relationships, family and community were also highly important to respondents. All respondents considered themselves to have a reasonably good quality of life and all described their home areas in a positive manner.

Around Lyon, the responses were not dissimilar:

"Leisure time, eating well, a fulfilling job, a healthy environment, family, nature, friends, one's house and garden, money, health, lack of stress" (Balan)

"Proximity of big town, being in the country, good access, community spirit, space, recreational activities, peace" (Grenay)

"Environment, -Peacefulness, Not to be bothered by plane noises! Just feeling good. Good social interaction. Feeling safe. It could be a garden, flowers, lots of things...The country. Rural environment. Not to be too close to your neighbours. To sleep in peace. Silence. Proximity of nature." (Jons)

“Personally it’s safety. It’s a whole: safety, environment, pollution. Respect of each individual, citizen in the town, it’s a certain amount of peace, it means green spaces, to be able to breathe, to live outside, it’s also to love and to be loved, to have a family and friends who are interesting and securing, with solidarity and no indifference, so that you don’t live self-centred but you are aware of other people and what happens elsewhere, to be informed too, listen to the news and read the press. It’s also a spirit of tolerance and mutual understanding” (St Quentin)

“Calm, Quietness, Greenery, Good neighbourhood, Garden, BBQ, Siesta, Swimming-pool, House, Oxygen, not to be responsible for your children any longer! Financial means, Going out, leisure time, Sports”

The Romanians also gave similar responses; family, health, money, jobs, entertainment and trips:

“money, ambition, guts, health, safe (secure) working place, security, trust, proper environment for business and government support (Tunari)

“family, health, jobs, money (Balotesti)

“financial resources, family, to offer your children a better life” (Otopeni)

“bills. Personal security, tomorrow’s security...health. Increasing the living standard, we work today for tomorrow, just to work, to have something to eat. Money! (Buftea)

“the family. The security of tomorrow’s life. Living standards. The job – if one doesn’t have it one doesn’t have the means....”(Mogosoia)

While there are slight differences between the responses from the three countries, there were far more similarities. All respondents mentioned health, family and security. There were however different emphases and expectations. The French respondents strongly valued communal spirit, an attractive rural location, peace and quiet, which was in accordance with where they had chosen to live. In the more rural study areas in the UK groups these factors were also important. In Romania, it is evident that respondents generally have a relatively poor living standard than in France, and even the poorer areas of Britain, and money and financial security is consequently of greater significance, whereas it is more taken for granted elsewhere.

Respondents in the UK and France groups were asked what things they would like to rid themselves of to improve their quality of life.

In the UK groups, crime, and other antisocial behaviour, (“youths hanging about”) were mentioned in all areas, as were air pollution (from traffic and aircraft). Aircraft were spontaneously strongly raised in all the French groups, as well as some particular local issues, such as chemical factories.

In Romania this question was asked as “What would you give up?” which elicited a different kind of response, as people had very little they could give up.

Descriptions of Areas

Respondents were asked to describe their localities by way of informing potential new residents of the good and bad points of becoming neighbours.

Manchester

In all the UK groups people were generally happy with the areas they lived in and although a few negative factors were raised, these were outweighed by the positive aspects. As might be expected, the number of positive aspects mentioned increased with the average house prices for the area, with Wythenshawe claiming the least selling points, and Wilmslow the most, for example, quiet and rural but with good access to amenities, good transport links, friendly community, and good schools.

In Heald Green, aircraft noise was only mentioned spontaneously by one respondent who had recently moved to the area. Here noise levels are very high, but houses are relatively well insulated for sound. Traffic congestion was a major concern in the area, although this was not necessarily associated with traffic generated by the airport, but general for Manchester. Noise of both road traffic and rail were raised more often by residents who had been in the area a long time than aircraft noise. Good points to the area were that it still had a sense of community, and although increasing in size and becoming ever more part of urban Greater Manchester, still had a village identity.

In Wythenshawe, air pollution was mentioned frequently, as well as crime. The group felt the main problem of living in Wythenshawe was the image it had to outsiders. They agreed that there was scope to clean it up a bit, but felt that it does not wholly deserve its poor reputation otherwise people just wouldn't stay. There was a tendency to disguise the area by referring to 'lower Gatley' or 'upper Heald Green', rather than Wythenshawe. The group described the area as *"Developing. Up and coming. Improving"*

In Stockport, aircraft were mentioned, *"... send the aeroplanes a different route"* as it is above these residents that aircraft tend to start their descents. People described the locality as *"A good area, house prices shooting up, friendly area, convenient, used to have good shops, but none now."*

In Northwich where aircraft noise is not significant, there were other more local problems, including smells from factories in Northwich, and a lack of recreational facilities. Locals would describe the area as very quiet, with not a lot to do, particularly for young people who *"have to go out of the area"*. The town has good access to local main centres, and was considered perfect for families with small children, as it was felt to be very safe. Negative points were traffic congestion and poor condition of footpaths.

Wilmslow residents all rated their locality very highly, and could find little to complain about. It suffers little aircraft noise, except when aircraft stray from their specified routes. The area is considered to have good housing, schools, a pleasant environment, good access, although traffic congestion is a problem. This is reflected in the very high house prices in the area.

Lyon

In France, aircraft were mentioned much more spontaneously in describing the local environment. All the areas were rural in nature and people had specifically sought this type of environment, and so in the main were happy with where they lived, although they would prefer to be rid of aircraft noise.

In Balan the two main problems were an increase of air traffic and the local Atochem factory. Five out of the seven respondents lived under the air corridor. A main area of discontent is the installation of a large chemical factory just outside Balan, which poses

potential health risks due to pollution and the danger of the chemicals exploding (as recently happened in Toulouse).

In Jons, not only does the air corridor pass overhead, but residents live close to both the TGV and Motorway. Jons suffers from a lack of local transport which is a problem for both the aging and the younger sections of its population. There are no facilities for children or young adults and so they need to go further a field for sports or cultural activities.

Here, pollution from Aircraft is a real concern;

“I’ve stopped growing vegetables in my garden because I’m worried about eating them, I’m worried about my health when I see that, you wonder what we’re breathing in, my doctor told me that the airplanes attack your nerves and your health, there are effects you can’t see immediately, long-term the noise and pollution affect your health, there are a surprising amount of allergies at Jons”

Pusignan is situated at the foot of the runways, but because of its spread, not all of the people interviewed suffered from the planes flying over their homes. Pusignan suffers from a fair amount of car traffic from other towns who are either going to the airport or TGV or just people trying to get onto the motorway. There are many complaints about road traffic and the pollution it causes as well as about the lack of pavements for pedestrians. Air traffic is real problem for the inhabitants, and there are real fears about the project to construct a new runway in 2015.

Grenay residents complained about anything which detracts from the rural idyll, “everything which can spoil the country”, including noise, pollution, problems with traffic, lack of transport, TGV. Aircraft noise was a particular complaint, as well as vibration, and pollution, which is blamed on aircraft;

“fall outs, we have a sunshade and we thought it was dirty but its from pollution. Even my lime tree, it had black leaves and I took them to a herbalist’s shop and they told me it’s not a disease its pollution”

“there are real fall outs so one can wonder about one’s health”

In St Quentin cars are a common problem, in terms of pollution and congestion, with many families having several cars. The village, although small has grown considerably and with narrow streets is not felt to be suitable for cars, and the current level of traffic. However, it was rated by some people as a good place to live, but there was concern that younger people were not staying in the area because of a lack of facilities and high property prices;

“there is work nearby: we are not far from Lyon and Grenoble, and we have all we need, apart from specific things, the population is mixed, we don’t have safety problems, we have different schools, and people are very friendly”

Complaints about pollution were made in Pusignan, but there was some dispute over whether aircraft was the source, with some who had moved to the village from Lyon saying the air was much cleaner in the village than the town. Other local issues were traffic, meaning road rail and air, insufficient public transport, and a lack of facilities for teenagers.

Otopeni

In Romania, there was a wide range of responses and opinions about each area. However, it was generally agreed that quality of life had declined over the last 12 years due to economic collapse. People are however, generally happy to live in the area because of friendly communities and a pleasant natural environment.

In Tunari and Dimieni people referred to how pleasant the village life was compared with the city, in terms of housing conditions, fresh air, being quiet, being able to have some land, and being more aesthetically pleasing. It was recommended to the moderator as a good place to move to.

"I have left Bucharest because I was thinking country life is better. And I was right. My life is beautiful, but if one doesn't work, one doesn't fight to get some extra cash, one can't survive".

"It is a nice peaceful area, people are OK, gentle, we are helping each other" "Good neighbours, silence, cleanliness"

However, aircraft did cause some problems, with helicopters being mentioned specifically. A drawback is pollution, and the perception is that it is caused by jet fuel. It is believed to cause problems for vegetation. In Dimieni air pollution appears to be a particular problem, impacting on agriculture.

"...my tomatoes, you can see on their leaves a dark screen...."

".. some sort of a black curtain of smoke"

"After every take off you experience some roaring, some whizzing in your ears for half an hour... but finally you'll get used to it"

In Balotesti there were very mixed comments about the area. There were several references to gypsies, and their animals (horses, pigs) which were blamed for noise and mess. There were no mentions of aircraft at all as influencing life here. Noise from road traffic was mentioned, although neighbours were considered quiet.

In Otopeni one respondent had moved there because of reports that the region had the best air quality and hence had the Central Committee Sanatorium there. *"This was the reason that motivated me settle here, the pleasure of working in a clean air environment; and I have done it with pleasure."*

Other people agreed that the place had improved over the years, *"The sanitation service, the public lighting system, the roads, the fitting outs, the schools... the gas pipes..."*

Otopeni apparently has special status and it was reported that the local budget resources are relatively high. It is considered to be *"a really beautiful neighbourhood, there are no gypsies, there isn't anything bad around... it is just rather expensive"*. It is considered clean, quiet, to have pure air, local shops and supplies, and to be safe. Some people however, mentioned that they could smell gases from the Airport depending on how the wind blew.

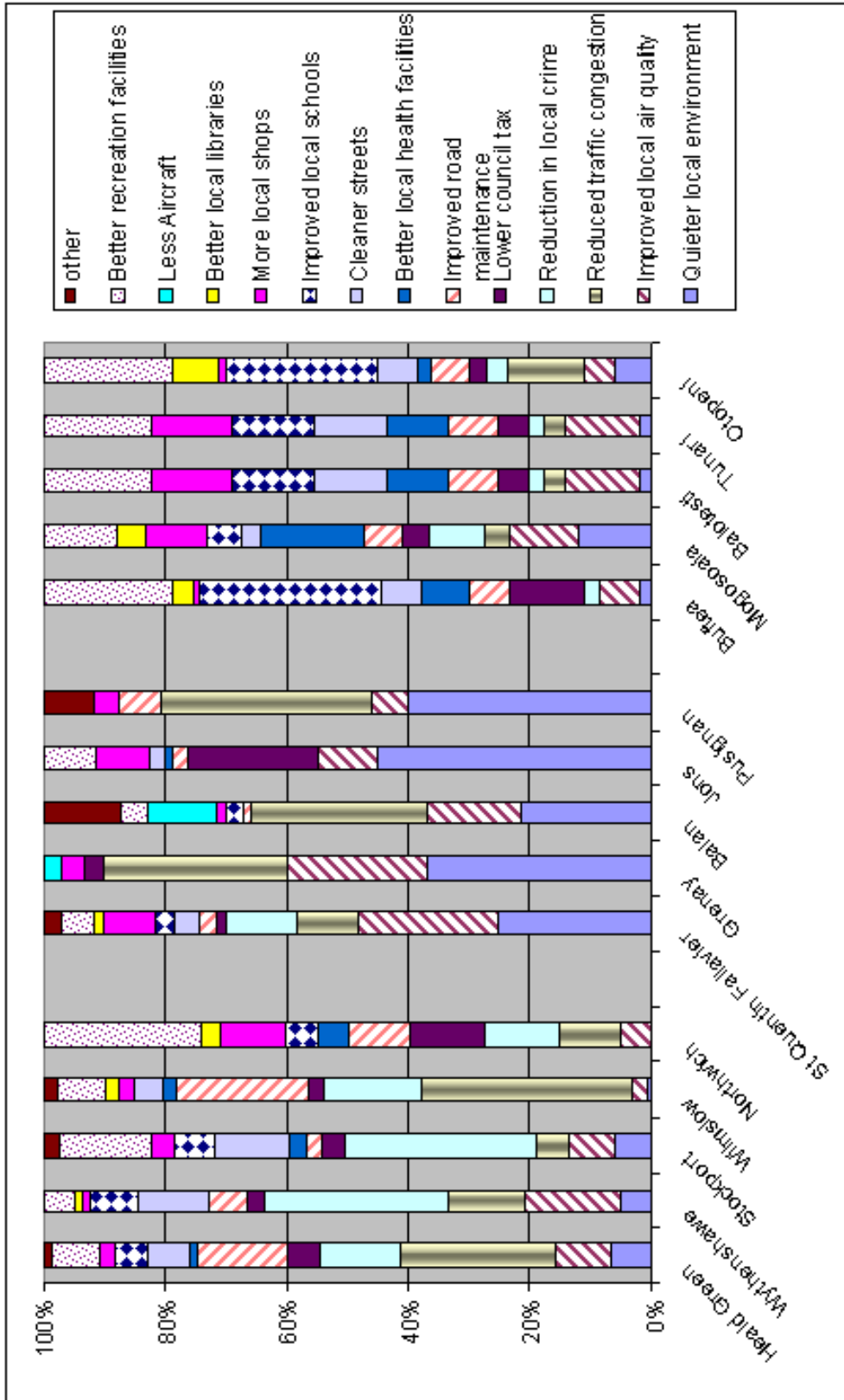
Bufta was described as a town that had declined over recent years. In the past, goods used to be more readily available, there were plenty of local activities, the place was small and beautiful. It is still liked for its proximity to a castle, water and a forest, *"it's a source of ozone, isn't it?"*. There is no hospital and there are few jobs, but is convenient for Bucharest.

Mogosoia was also described as being in decline; *“This town used to look different. It gets worse every day...”* although some areas of the town are much better than others. Problems mentioned included trucks and associated ‘gases’, the garbage pit, rubber burning, smell from chicken farms. On the positive side it was described as quiet.

Budget Allocation Exercise

In order to put the negative aspects of an area, including aircraft noise into context an exercise was conducted. Respondents were given 10 units of ‘money’ and asked to allocate this budget to any of the issues on the score sheet that they felt needed improving. The basic list was the same for all three countries, but all respondents had the option to add any ‘other issues’ that were of particular importance to them. Figure 3.1 illustrates the results for all locations. There are clear differences between the three countries.

Figure 3.1 Budget Allocation Exercise



While there are differences between local areas within each country depending on specific local issues, the differences between countries appear greater.

A 'quieter local environment' is of considerably greater importance in France than in either Romania or the UK. It was the only place where 'less aircraft' were specifically raised as an 'other issue'. The highest proportion of budget allocated to this issue was in Jons, and this may have been due to the presence of a local activist.

In the UK, the scores received for this issue, together with air quality correlated to the amount of air traffic in each location, being higher in Heald Green, Wythenshawe and Stockport. This relationship does not hold true for Romania, as it would be expected that Mogosoaia would experience similar noise levels to Buftea, but the scores are different. However, noise from trucks are believed to be the reason for this rather than aircraft noise. In France, it is unclear which areas have the most noise, but based on distance from the airport it would be expected that Balan and St Quentin have least noise and this is reflected in the scores. These are however much higher than for the UK.

Traffic congestion in Romania is of far less importance, and is clearly related to levels of car ownership. In France, it was reported that 'traffic' includes all modes, whereas in UK and Romania this relates to road transport. In Romania, important improvements required are better local schools and health facilities, reflecting the lower access to provision experienced there than in France or the UK. Romania is also short on recreation facilities, but not much different from the UK. Crime is a more significant feature in the UK than in Romania or France, possibly as a result of the more urban nature of the study areas.

That aircraft noise is given much higher priority in France than the UK, for similar levels of noise, can be explained by several factors, as will be shown in subsequent chapters.

In the French groups, people had moved to the rural areas specifically for peace and quiet and the aircraft deny them this quality of life aspect, and hence they are annoyed by it. In the UK groups, the study areas were more urbanised and hence ambient noise is much higher and the aircraft have a less noticeable effect. In Romania, although the areas are rural and it might be expected that the noise would impinge in the same way as in France, it doesn't because basic needs, such as health and education are not met to the same degree and hence are more important.

A second main difference between France and UK is lifestyle, which is largely governed by the climate. The French reportedly like to eat out and socialise in the evenings and aircraft noise interferes with this. It may well be that the British would like to do the same, but the climate means that this is not possible on a regular basis.

Introduction

Respondents were asked to describe what it is like living near an Airport, in terms of the advantages and disadvantages. Around Manchester and Romania the advantages were felt to outweigh any disadvantages, although for differing reasons; the reverse was felt by the French groups.

There were very few respondents from the UK groups who had not made a leisure trip via Manchester Airport, and there were several who made frequent business trips by air. In Romania, foreign and domestic air travel was not the general experience of the group respondents, but there was an appreciation of the economic benefits brought by the airport and it was seen as essential to the future prosperity of the area. In France, the residents around Lyon are evidently more predisposed to use the TGV rather than air for longer distance domestic travel and because of the climate there is less demand for foreign leisure travel than in the UK. The airport is not central to the local economy and hence the advantages recognised elsewhere are not in the French groups.

It should be noted that the findings for France and the UK in this context are more specifically related to the local airport and its geography rather than national characteristics and other airports might have shown different results.

Advantages

Manchester

In Manchester, several advantages were given of being close to an airport. The main ones were a short journey time, ease of access, and relatively low cost of access when using the airport either for holidays or business use. This aspect was variously appreciated according to the amount of air travel undertaken by an individual.

“I’d rather get in a taxi for ten minutes to go on my holiday, rather than get in a coach for like two or three hours”. (Stockport)

“... I never used to really consider being close to an airport, until I used to come back from holiday and speak to someone and they’d got to have a three hour journey to go back somewhere and I thought, Christ, you know, if you’re in a plane for seven hours or whatever, how lucky I am to jump in a car to go home. So, it’s only then that I realised that actually I am close to an airport.” (Northwich)

Some respondents in Heald Green stated that they would be able to check in and then go home again, and also in Wilmslow this was an option if there were any delays on their flights. One respondent in Wilmslow also found that he could take a London based job and still live in Manchester as he only needed to be in the office one day a week.

The airport was felt by most people to have a very positive effect on the local economy and for Manchester as a whole. People in Wilmslow, Heald Green and Northwich all felt the airport had a positive impact on their house prices because of the ease of access, good transport links and the jobs provided.

"Mainly because it's convenient to the airport, I mean that is probably a selling point to people moving in" (Northwich)

"I think it's kept the properties in the area, kept the prices of the property and brought a lot of business to the area. That's why I've no objections to it at all, I think it keeps the economies very healthy round here and offers employment for so many people, I think it's good" (Wilmslow)

Heald Green and Wilmslow residents felt the availability of part time and seasonal jobs was a good thing for younger people in their areas.

"We've got local employment for kids. It's one of the main places where seventeen, eighteen year olds ... I went there when I was seventeen to get a part time job" (Heald Green)

However, the Wythenshawe group were less enthusiastic about the employment opportunities, despite this area having relatively high rates of unemployment;

"Well, even the jobs at the airport are no good now, are they?"

"No, they're all part time, anyway, aren't they." (Wythenshawe)

Some people also felt that living close to the airport had secondary benefits, in that transport links, road and rail had benefited from investment because of the airport, for example;

"It also has a knock on effect. Because Heald Green is still on the fast [rail] route into Manchester. So you have got the airport, then Heald Green and then another link into town" (Heald Green)

Lyon

There was a mention that it was an advantage to be close to the airport if there was a need to travel by air, or to meet someone arriving there. Some people took their children to watch planes, so the airport has some recreational value. It is recognised that it brings jobs and tourists and hence;

"economically, it's positive" (Grenay)

"Some firms have settled here because of the airport" (Balan)

*"We are very close if we need to take the plane, rather than driving 20kms".
"There are some businessmen who have come to live in Jons because of the proximity of the airport, they need it" "It's good for business too". "As far as business is concerned, the airport brings me something, it's not just negative, drawback of the noise, but advantage for work" (Jons)*

"Work. I travel a lot for my job, so proximity. Road infrastructures which are developed more when there is a big airport nearby. Development of the industrial zone. It's good for the economy of St Quentin" (St Quentin)

Overall, there were fewer advantages quoted from the French groups for proximity to the airport than in the UK, with few respondents reporting being users of the airport themselves. The residents of Pusignan were more positive about the benefits of a local airport than was observed in other groups;

"An advantage is that if you are taking the plane, it's not far to go!....that it gives jobs to people who live nearby. And infrastructures are developed

like motorways etc... it can be a good thing. It brings some royalties” (Pusignan)

“Another advantage is that they have grouped railway and air on one site: so you can get off the plane and hop on a train etc...Thanks to the airport, there will be some motorways built to bring us closer to Lyon. If there wasn’t the airport, we wouldn’t have the TGV or anything around. There is a project at the airport in Satolas for a railway terminal Lyon -Turin to put lorries on the train, when it is installed, there will be millions of jobs created, with more noise of course” (Pusignan)

Bucharest

Several advantages were mentioned, mainly from the point of view of economic improvements, which are seen as essential for the area. It was also accessible in case one wanted to travel, and it was considered possible that local infrastructure could benefit as a consequence of investment in the airport.

“There are a lot of foreigners coming to the airport “

“jobs have been created”

“many people from Balotesti are working at the airport and they are very pleased because they are very well paid.”

“they will make a subway line....and go right in the centre of Bucharest”

In Tunari there were far fewer advantages noticed than at Balotesti, where there appeared to be fewer people employed at the airport. Similarly the residents of Mogosoaia did not perceive themselves to be near to the airport although it was recognised that the airport would influence development. However at Otopeni, numerous advantages were given;

“.. one can find a job and ... life is more fulfilling, more decent compared to the rest of the country”.

“..it is decent for the fact that it is a gateway to Romania, they are fixing the road, I hope there will be some improvements. I have seen they are doing measurements for some viaducts, or something like that.

“...we should be proud of having an airport nearby. Because there are tourists coming, from other countries too. Our Romanian fellows leave too, whether they have the means or they leave on business trips.”

“... a big amount of money from the airport comes to the local budget.”

Disadvantages

Manchester

Aircraft noise was mentioned in three groups (Heald Green, Wilmslow and Stockport) as a disadvantage to the area. The noise from aircraft was not thought to be a problem most

of the time, but there were specific times, during specific activities when aircraft noise was found to be intrusive. These are explored in some detail later.

Respondents in Heald Green found it annoying that people parked outside their houses and then took a taxi to the airport rather than using airport parking facilities. No one appeared to feel that the traffic congestion they experience is as a result of the airport traffic, but the same as is experienced in other areas. Those working at the airport are affected by traffic but apparently no more than anyone travelling in the peak to other destinations.

Air pollution was mentioned in all groups, and its possible impact on health was perceived, although other sources than aircraft, eg traffic are recognised;

"... I mean the pollution from the aeroplanes. The noise doesn't actually bother me." (Wythenshawe)

"...one of the doctors at the clinic said to me there's a big report that she'd read that was quite frightening really for the residents of Heald Green. Some of the things like skin complaints, air, asthma and chest infections .. the ratio is far higher in our area" (Heald Green)

"Well, I suppose the air pollution, probably, comes well into Wilmslow" (Wilmslow)

Although the airport was generally felt to have a positive impact on house prices, it was appreciated that selling a house could be difficult to the uninitiated.

".. it would put people off. We had .. our next door neighbours were trying to sell their house and people came in and they'd wander off. One poor woman was really excited about the house, beautiful .. and then she stood in the garden .. terrified, absolutely terrified of the noise" (Heald Green)

Lyon

The aircraft and the noise and pollution associated with them are seen as considerable disadvantages to residents living in the villages near to the flight path east of Lyon. There appears to be a low propensity to travel via the airport and hence it has low value;

"I don't use the plane very often, so I wouldn't mind driving a 100 kms to the airport. I'd prefer it further away. I would rather live quietly for 12 months and waste one day..." (Balan)

There are many other disadvantages including safety, value of property, potential damage to property caused by vibration. Other disadvantages mentioned included;

"Bad sleep. A financial cost: double glazing" (St Quentin)

"Pollution. There is a lot of asthma and allergies in Jons. Noise. And we are always afraid of an accident" (Jons)

"If they are freight planes, those huge things, it's unbearable, it makes the windows vibrate" "it's a constant noise, it's a constant risk" (Balan)

Even if the airport has created industrial development in the area, with obvious economic benefits, the type of employment created is perceived to be mainly low level, low paid jobs and local inhabitants are totally unaware of any priority scheme regarding job offers.

“Another negative point to raise is that all the jobs generated by the airport for the area, aren’t high-flying jobs” (St Quentin)

Even though housing prices have actually increased in the area over the past few years, there is constant fear that increased air traffic will inevitably result in the collapse of house prices, although this view is disputed because the areas have other advantages.

Furthermore, the destinations and the cost of flights from Lyon airport are considered to be rather limited and the prices expensive. Respondents go as far as Marseille, Geneva or Paris (via TGV) for cheaper international flights.

There is bitter feeling towards the fact that the access the airport via the motorway is not free, and concern that new developments connected with the airport will also be detrimental rather than beneficial to the local area.

Bucharest

A spontaneous response to disadvantages of being near the airport raised in Balotesti was safety, where there had been an accident in recent memory. Low flying aircraft cause the sensation of fear. The accident was also remembered in other areas, including Otopeni.

“it means danger at any time”

“A disadvantage would be the danger (safety), you have heard about the accident in Balotesti. It could have been on this side.”

“because the pilots don’t follow the flight route (path). They are not allowed to fly over the houses, these are the instructions....I can see all the times airplanes flying above my house”

At Otopeni, there is a further issue with fuel tanks associated with the airport which are seen as a source of potential danger. Disquiet over possible breaches of planning regulations and the rejections of complaints on the matter have made this an important local issue.

“This is a bomb that hangs above all of us“

Pollution was a major concern, to health and to crops. Fuel dumping was believed to be the main cause. This varied in different areas.

“often the crops are destroyed” (Balotesti)

“when the airplane raises from the ground, I can see something burning, and I can see that a fog falls when it passes”

“As it empties its tanks, it pollutes all the area. Then, there are the burnt gases from the taking off, as well as from the landing”

Another problem associated with the airport was interference with TV frequencies, and also telephones, and at Otopeni, heavy road traffic was attributed to the airport.

In Tunari, there were structural problems to houses believed to be caused by vibrations from aircraft, but there was some doubt from some of the group about this, with road traffic also felt to be responsible. It was however noted that windows tremble when aircraft pass.

Noise was also mentioned, particularly in Otopeni, although some said this was minor compared to air and soil pollution.

“the noise, what else?”

“I think the phonic pollution is substantially smaller than the air and soil pollution”

At Mogosoia, far more disadvantages than advantages were given as they saw themselves as too far from the airport to consider it for employment, and the noise and vibration from aircraft was a nuisance. Helicopters were also a cause of complaint. People also referred to the fuel deposits caused by planes;

“when they take off and pass over our town they leave behind the fuel that they use and this leads to the pollution of the plants in our garden”

People also considered the danger in case of an accident, but noise and pollution are the main concerns.

Introduction

Although many respondents raised the issue of aircraft noise when thinking about their quality of life and their home environment, several other sources of noise were also mentioned. In this section, we explore how different noises impact on people, then more specifically in connection with aircraft noise and issues of intrusion. Responses to different aircraft noise types were then analysed.

It is important to make the distinction between:

- Not noticing noise;
- Noticing noise, but not considering it a problem; and
- Noticing noise, and considering it a problem.

Annoying Noises

Respondents from all countries had a number of examples of noises that were considered to be annoying, but not all occurred everywhere. From the comments made, the following noises are prevalent in the survey areas.

| Noise Source | UK | France | Romania |
|---|----|--------|---------|
| burglar and car alarms | ✓ | | ✓ |
| dogs barking | ✓ | ✓ | ✓ |
| Kids playing | ✓ | ✓ | ✓ |
| noise from motorbikes/ mopeds | ✓ | ✓ | |
| rowdy people late at night | ✓ | ✓ | ✓ |
| other people's loud music | ✓ | ✓ | ✓ |
| traffic noise | ✓ | ✓ | ✓ |
| trains | ✓ | ✓ | ✓ |
| sirens from emergency vehicles, police. | ✓ | | ✓ |
| construction | | | ✓ |
| Chainsaws, lawnmowers | | ✓ | |

In the UK, traffic noise received many comments, particularly from those living on main roads, but also on residential roads. The annoyance caused on residential roads was because it was felt it was from traffic that was not supposed to be there, and where road humps caused the noise to vary because of varying speed.

In France, the proximity of the motorway to certain towns (in particular Puisignan and Balan) creates an additional problem;

“A permanent humming noise due to the constant flow of vehicles”

“It's a continuous noise, it's a dull noise, when you right next to a motorway the noise is awful, the noise is more of a permanent dull hum, it's unbearable, it starts at six in the morning from all the people drive from east to west “

In France, although car traffic noise was a nuisance, it was found relatively easy to live with, because cars are a real necessity for a majority of the inhabitants;

“you can’t get around without a car, local transport is very poor, you need a car here, you don’t notice the noise much it’s not like the airplanes, at least we all use the roads, we all participate in creating the problem”

However mopeds ridden by youths, for pleasure rather than as a means of transport were considered very annoying, particularly by the French.

In Romania, the noise from road traffic is thought to be particularly bad because of the poor condition of road surfaces. A common noise complaint here was construction work, pick hammers, cranes etc, which can evidently occur at unsociable hours.

“I am very nervous when they build behind the blocks, and from the morning till night they use those hammers, those big hammers, how are they called... pickhammers. And it drives one crazy...” (Buftea)

“From six A.M. one can hear a pickhammer noise that drives one crazy.” (Otopeni)

The common nature of the ‘annoying’ noises was felt to be the lack of control over them, and their lack of predictability.

“House alarms and car alarms that go on and go off all night and all day, there’s loads of those, that’s intrusive, when you are trying to get a kip” (Wilmslow).

“No, aircraft noise is fine for me because ... at our old house we experienced a dog noise ... and that ate into my brain something shocking” (Heald Green)

“I live near to someone who has 7 dogs and they leave them alone all the time, the dog next door makes a real racket even if he’s really small, when one dog starts barking they all do it” (Fr)

Some thought that ‘inconsiderate’, neighbourhood noise such as people playing music loudly in their back garden or having late night parties was more disturbing than aircraft noise. The following quote from the Heald Green group illustrates this;

“...the odd summer night late night party or .. we had more trouble with our neighbour’s son at the bottom of the garden who insisted on having his radio on very loud ... it was just so intrusive because it was affecting everybody else’s enjoyment. Now planes are not personal. They’re not saying, right we’re going to get up your nose. They’re actually doing their job. So you tend to have a different attitude towards them” (Heald Green)

“Lawnmowers make almost as much noise as planes, people never respect the proper hours for mowing the lawn, it’s really loud when someone mows the lawn” (Fr)

“It’s terrible when the young people come out on their mopeds it makes a real racket, mopeds make a piercing sound, it makes you want to kill”(Fr)

“People who play really loud music, I can’t stand it in summer when the neighbours listen to their music really loud, there are some teenagers living just down the road the music blares out from the house, I can’t stand neighbours who don’t respect the proper hours for these things, some of these parties go on all night, in the woods near by there was an all night

rave party you couldn't get to sleep, some people just have no respect, no civic spirit they don't care, Last week one of them had a two day party it was unbearable" (Fr)

Some just felt that "...any noise that goes on for any length of time repetitively" (Northwich) caused a noise to be annoying.

However, the French groups in relative terms considered aircraft noises more annoying, which was not the case in the UK. In France, even if these noises are perceived to be extremely annoying they are not believed to create any additional problems such as long term health or auditory problems and consequently they are perceived to be less harmful than the noise coming from the planes.

"Lawn mowers make more noise than planes but you don't have 600 of them per day, a lawn mower is not going to ruin your health "

And furthermore, the fact that they are neighbourhood noises means that they can be resolved and that they are "manageable" problems. A French view conflicts here with the UK view given earlier.

" you can put a face on the culprit and do something about it, you can sort it out, you don't just have to live with it, barks will stop but the airplanes won't, there are solutions for dogs special collars which give out an electrical impulse when it barks they soon stop" (Pusignan)

Local Aircraft Noise Exposure

All the study areas were near enough to an airport to be affected by noise from aircraft, but to varying degrees. This allowed the reaction to aircraft noises to be put into context of current experience of noise. Using the ISIS noise simulator, respondents were subjected to a noise of a B747 400 departing. In the UK and Romania the simulation was played at a peak of around 80dBA as measured with a sound meter, but this varied from group to group due to the vagaries of the room acoustics.

There was often disagreement within the groups, as some people appear to be exposed to higher noise levels than their neighbours, and there was also wide variation in the range of aircraft types heard. Other criteria were noted that affect the intensity of the typical noises heard, mainly wind direction, and other weather conditions.

In general, few people in the UK and Romania said that their typical level of aircraft noise was as high as that played, at around 80dB, whereas many of the French thought the noise played was not as high as they usually received. It is not known what volumes the groups in France were subjected to as these were not measured, but it is likely that it was of a similar order. The French groups tended to refer to the loudest sounds they heard rather than the average. This may be why they appear to claim that the recording was not very high. We have no sound meter data from the actual areas to validate the comments. However, one apparently knowledgeable respondent at Jons gave the following information about noise levels in the area;

"In January, we had an average of 54 dB, 54.2 in February and 53.5 in March, whereas in Pusignan, they had 48.6, 48.5 and 49.4"

These levels do not sound very high but it is not known which metric was being quoted.

Table 5.1 Response to Recording

| Location | Response to First Recording at around 80dBA |
|--------------------|---|
| Heald Green | <i>That's a popular one. That's like a normal .. That's a normal every day You would know there's one going past but you wouldn't ... it wouldn't draw your attention I don't think you'll get a lot quieter ...</i> |
| Wythenshawe | <i>I wouldn't hear that loud. I would. On the playing fields, then yes, I would. I would. Not like that, no. It depends where you are.</i> |
| Stockport | <i>In the middle of it, in the peak of it, it was noisier than what they normally have when they come over here. There was a certain amount of, there was an increase during the peak of that flight path</i> |
| Wilmslow | <i>Never. Never. Hardly ever. No, that's Mobberley.</i> |
| Northwich | <i>Much louder (than where we live). Yes, much louder. That's on the runway, that is, I think?</i> |
| Balan | <i>I would say it's less loud (than where we live) It's funny: we don't all agree I'd say it's less</i> |
| Grenay | <i>I'd say not as noisy I would say as noisy Only during the summer A little less maybe Less noisy</i> |
| Jons | <i>That's at night, it makes that noise at night I don't know... this one isn't very loud It's not the loudest!</i> |
| Pusignan | <i>I would say that's not the type of noise we hear It's more muffled It's more vibrating We hear it, maybe not the same intensity, but it's not the majority We hear this, when planes don't follow their flight paths Air-Algérie makes more noise than that!</i> |

| | |
|-------------------|---|
| St Quentin | <i>Yes, it's just like that when we eat outside with some friends</i> |
| Balotesti | <p>I think this is an airplane at a lower height, that passes over your heads.</p> <p>Never.</p> <p>No, never.</p> <p><i>Yes, yes. Every time the plane comes to land I can hear this noise.</i></p> |
| Buftea | <p>Seldom.</p> <p><i>We can't hear it so loud...</i></p> <p><i>We can here them especially at this hour...</i></p> <p><i>Yes, about now, in late afternoon...</i></p> <p><i>At four or five o'clock pm...</i></p> <p><i>If you are outside...</i></p> <p>This is the noise of an airplane at very low altitude... They don't pass so low here...</p> <p><i>Low...</i></p> |
| Tunari | <p><i>One could hear the noises louder than this one, over at my place.</i></p> <p><i>I don't think of the planes as loud or silent.</i></p> <p><i>We don't have...</i></p> <p><i>One can't hear them.</i></p> <p><i>They are rare.</i></p> <p><i>There are two or three per week.</i></p> <p><i>Well, there are noisy airplanes at our place. I am telling the truth. I could have said that the noise is not strong, but it is.</i></p> <p><i>Still, it is noisy at my place.</i></p> <p><i>It is 'stronger' than this one.</i></p> <p><i>At my place, the influence is lower</i></p> |
| Otopeni | <p><i>You can hear the noise in the summer, not in the winter.</i></p> <p><i>Two, three times during the day. I don't hear them during the night.</i></p> <p><i>A few times a day. Three, four times a day.</i></p> <p><i>We can hear the airplane noise at this level or even at a higher level.</i></p> |
| Mogosoia | <p><i>This airplane is closer, otherwise one couldn't have heard it so loud.</i></p> <p><i>Never so loud. Never.</i></p> <p><i>So never it is.</i></p> |

Annoyance of Aircraft Noise

There is no doubt that the respondents from around Manchester found ambient aircraft noise to be far less annoying than their French and Romanian counterparts, with the French being most critical and opinionated about the subject.

The Manchester respondents in the survey tolerated the levels they lived with largely without complaint, whereas the French found aircraft noise to be the main negative point about their home location. In Romania there appeared to be other more pressing factors to occupy the mind than aircraft noise. This may in part be related to the long established procedures in place at Manchester to deal with complaints, whereas at Lyon this is relatively new.

Annoyance, or intrusion of the noise clearly impinges on the French respondents more, and the reasons are explored below.

Personal Response to Aircraft Noise

Analysis from the French groups shows that air traffic is a problem for them because:

- It's a repetitive and frequent problem
"It starts every night at 7pm and carries on every minutes until about 9 pm, there is plane every 3 minutes from 7 to 9pm, it's a constant deafening sound"
- It's a problem which disrupts the bodily routine
"I have a problem sleeping after I've been woken by a plane, I get woken up all summer by the 6am plane and I can't get back to sleep afterwards, the late planes sometimes wake me up, there is a plane at 6am particularly on Sunday I would like to have a lie in but it cuts your cycle and it's impossible you go back to sleep afterwards, it ruins your bodily cycle, when you hear one when your asleep it really makes you jump"
- It's a problem which has an impact on the morale
"the noise from the planes is stressful, it makes me feel really tired when there's that constant noise, stress, it put you in a bad mood, it's really tiring, so in the end you feel tired, annoyed and stressed out"
- It's a problem which is felt like an aggression on self and home
"You can feel it when the planes pass really low, the are big cargo planes make you shiver, it makes the house vibrate, you can feel a tension in your heart"
- A problem which is increasingly felt by the local inhabitants
"St Quentin is ideal the only problem is the noise, planes are constantly flying overhead, it's very very noisy, I wouldn't recommend our village to anyone because of the noise, I'm moving out next weekend and going back to live in Lyon mainly because of the noise, it depends but the days you have fifty planes flying over your head I'd say your quality of life wasn't fantastic"

The British and Romanians appear to be more stoic and agree that there are problems with aircraft noise that intrude on certain activities, but there was no indication given that it has a such an effect on a personal level.

Adaptation

Adaptation to levels of noise was reported in all groups, in all countries. This worked both ways, with people who had moved to very quiet areas reporting that the silence was unbearable for a while.

"If you go to the mountains, it is too quiet....it drove me crazy" (Balotesti)

"...my sister moved from Wythenshawe to Crewe, she's used to the noises of the trains now, but when she comes back to Wythenshawe, she's like Whereas to me its nothing, when I go to Crewe, the trains disturb me. We're just so used to it, its background noise" (Wythenshawe)

It was agreed by many that when people first moved in to an area where aircraft, or other noise was a feature there was an adjustment to be made. In the UK, respondents considered it took about 5 to 12 months to 'get used' to aircraft noise, of whatever level. The degree of adaptation depended on the relative importance of other factors, for example, road and other ambient noise levels, but the main criteria appears to be the perception of the airport and its utility to the individual and local area.

Even in areas with high levels of noise, this could be adapted to by most people (those that couldn't wouldn't stay). This was most striking in the Heald Green area, where noise levels to the uninitiated appeared intolerably loud. There was one respondent who had recently moved into the Heald Green area and so hadn't 'grown up' with the aircraft and was finding it difficult to adjust to the noise, but longstanding residents assured him that he would adapt.

"I think the noise level's ridiculous"

"You just get used to them"

"I've lived here for thirty years. Its just a natural part of the environment that we live in"

"I've just got a general problem is that I can't remember ... I can't remember when I last heard an aeroplane in the back garden (Heald Green)

"I've lived at Heald Green, which is right on the .. you know, you can wave at the passengers as they come in and you do get aircraft noise, but you don't notice it" (Northwich)

"they don't bother me, though, I don't mind living near an airport" (Wilmslow group)

In France, fewer people agreed that they had got used to the noise, but there were some. Those that had not adapted had stayed on in the areas because of the other advantages offered, but were very hostile towards the airport.

Some people in Balan have noticed increases in the amount of air traffic, but admitted that in terms of noise levels, they had got used to it;

"I'd say the noise has doubled... you don't notice it in fact"

"yes, you get used to it"

Some people in Grenay however, said they escape at weekends to the mountains to avoid putting up with the aircraft noises. Others said while it was tolerable while they were still working, they did not envisage spending retirement leisure time in the area.

“So far I haven’t felt the need to go to escape the planes, I haven’t got there yet! But when you have friends over, they notice it, we are used to it, we don’t pay attention any more.”

In Jons, there was a similar picture,

“I think to the planes, I got used to them now”

“Yes, one gets used to planes”

“In the winter, I don’t hear them”

The activist present in the Jons group argued with the other respondents about their acceptance of noise,

“If you ask doctors, they will tell you it eats into you nerves - Personally, I would qualify opinions: we say that we prefer planes because we live below the flight paths from the airport in Satolas, because Jons is right in their axis, but you must know that the traffic is quite substantial, especially in the morning and evening, but with some other airports, its all day long, so if it happens here one day, and I hope I would do everything with my organisation to stop it from happening, it will become unbearable and it will be as terrible as the nuisances from the TGV for the people who live next to the track and the motorway..”

And in Romania, many agreed that the noise could be adapted to.

“And I, that I have grown up here with the airplane noise in my ears, I have gotten used to it, and now I almost don’t hear them taking off anymore.” (Otopeni)

“I can hear a noise I already got used to. I can hear it. But I don’t pay enough attention to it. So I got used to it, as I am born here and the planes are flying over my house since I was a little boy.” (Otopeni)

“I live near the runway and I don’t hear the noise anymore, I don’t pay attention to it, I ignore it I have been born here... it doesn’t bother me” (Tunari)

“We got used to the noise” (Balotesti)

“Maybe we have got used to it... We ignore them. The trucks pass... “

“One can’t hear them anymore...”

“I will make another comparison: it is as if I lived near a railway. If I go to a relative that lives near a railway, at two o’clock in the morning I wake up and ask: what is going on? Is the train passing through the house?” (Mogosoia)

Many people mentioned how awareness of aircraft noise varied when the issue was raised by visitors to the house. Some found this quite stressful as it caused them to notice sounds they do usually ignore and many found themselves feeling they had to justify to their friends and family why they live where they do.

“it puts you down a little bit, ‘how do you live in a place like this’, it’s not nice, is it.” (Wythenshawe)

"I don't know about you but don't you find yourself explaining the situation to somebody who doesn't actually live round here. When I've got friends who have come over from somewhere else and they'll go ... 'oh God Lisa' ... and then I find I'm a bit intimidated then ... and I go ... 'well erm, what it is ... ' you know ... and I'm thinking hold on a minute, I live round here, you know. But because they're not used to it. That's the only time I feel myself sort of having to explain the situation" (Heald Green)

"When we have people over, they are afraid and they tend to make us afraid, because normally we don't think about it too much" (Jons)

Intrusion

Groups were in agreement about how aircraft noise was intrusive when it prevented the carrying out of desired activities. It was generally agreed that the intrusion was worse in summer than in winter, when there was more opportunity to be outdoors, or indoors with windows open. Winter had a further effect in that lying snow deadened noise, but this was only referred to in Romania. In France and the UK the amount of air traffic was also noticeably higher in summer than winter.

Sound insulation measures such as double glazing appear to be more prevalent around Manchester than the other areas. As well as this being achieved through grants from the airport, the climate in the UK is an incentive to double glaze, and this is common in all areas, not just near airports. In France there was some resentment that only a few households had grants for double glazing, and that for most the cost had to be borne privately. In Romania very few people appeared to have the financial means for such measures.

The better climate in France, together with the lower levels of double glazing meant that the Lyonnaise felt aircraft noise to be far more intrusive than did the Mancunians. The Romanians gave plenty of examples of incidences of intrusion but many of these were caused by noise sources other than aircraft, and generally gave the impression of being less aggrieved than the French.

Aircraft noise is generally agreed to be intrusive when;

- It stops you from being able to relax

"It's worse at the weekends, the summer when you get home from work and you want to relax, you can't decide yourself when you can relax, it's like a constant aggression between 7-9 pm"

"In summer in the evening during meals, in summer if you want to eat outside in summer at night if friends come round to eat, if you want to have a conversation with someone outside, if you want to talk to your neighbour in the garden, when you are at the neighbours, on the terrace, if you go to a friends house, when you want to invite friend for supper"

"in summer during the day when gardening, in summer during the day if you are on the terrace doing something, during the day in summer if you want to play with the children in the garden, when you are outside the school having a chat, "

"In summer during the day if you have a sleep, in summer at night when you want to sleep, if you want to relax and sunbathe in the garden, when

you want to have a nap in the garden, when you want to relax on the terrace, when you want to watch television inside the house, in front of the TV with the windows open, if you want to have a nap, if you want to sleep at night with the windows open”

“In winter when you watch the TV, in winter when I’m reading, in winter at night when I’m sleeping, In winter during the day if you have a sleep” (Fr)

“Yes, it’s when you’re out in your garden, you actually notice it. Yes, in the summer nights when you get your window open, it does disturb you. particularly Sunday, Sunday is horrendous” (UK)

- The noise stops you from hearing or being heard

“When you have to shout to be heard, When you have to stop talking and wait until the plane has gone past, When you have to make a real effort to try to listen to what someone is saying, when you can’t hear the television, they usually go past just at the crucial moment and you can’t hear what’s been said” (Fr)

“When the plane prepare to take off, one couldn’t communicate with another person. Just can’t hear anybody, any other sound. And this is until the plane leaves the area. One can’t communicate at all. And this is bothering us. After they (the planes) take off, when they are a few kilometers away, up in the sky, we can talk to one another. It can’t be done otherwise. If we have a family reunion, a celebration, we are in the yard and a plane passes... Well, if there are so many people... we can’t talk anymore and listen to that noise...all of us.” (Romania)

“Very occasionally if a plane is flying low ... say if I’m watching a video or something and it’s a bit quiet or something, I might miss something ... I’ll just rewind it back and then ... try it again. I tell you one time it does affect me is when it’s gone over ... and I’ll be talking to somebody on the phone and it’s gone over their house and now you can hear it on the phone ... oh there is it, gone. And to be honest that’s probably the only time. Other than when you’re sat in the garden and you’re having a conversation and the intrusive ones” “When you’ve got the patio doors open and you’re watching the television and then the frequency of them coming in is such that it interrupts your enjoyment of the programme” “to me it is an annoyance, if we’ve got the back door open on a summer’s night, every twenty minutes, you can’t hear two minutes of the TV” (UK)

There appeared to be few problems around Manchester with sleep disturbance, with most people being under the impression that there were no night flights, which is not the case. However, most of the houses in the area most affected by noise are double glazed and at the time of year when the research was conducted the weather had not been warm enough for windows to have been routinely opened, which may have affected the responses. The only Heald Green respondent who was aware of night flights was the new arrival to the area:

“I do hear them in the night. It seems ... I’m sure at two or three o’clock in the morning I’ve heard them either landing or taking off”

“No, they’re not. They finish at two, they do finish at two, they don’t go through the night “

"It's been a hell of a lot better since it stopped at two in the morning and it starts off again at half four, five, whatever it does"

This demonstrates the effect long exposure over time has on the response, with most simply not hearing the noise that was intrusive to another person not accustomed to it. The group were however anxious that night flights were not going to be a feature of Manchester Airport.

"We certainly don't ... we don't want that" (Heald Green)

This was also a major concern at Lyon;

"What worries me most about planes is if they start night flights"

"you can tolerate certain things during the day but it would be terrible at night"

"I work at night and I don't tolerate it more during the day"

One resident of Buftea was in favour of night flights; *"I'm a good sleeper. I would rather let them pass all night, because I don't hear them"*, but this was not a universal view.

In Mogosoia and Balotesti, it was not the planes, but construction, birds and social disturbance that caused loss of sleep.

"Can I say that the birds from my yard bother me?"

"... there are the police squads...They come and arrest some of them..Well, since they come at five o'clock in the morning! At five or six o'clock, it is obvious that it is annoying, because they wake you up".

"One hears the planes at night, if one is outside. They don't really bother us, but... "

"During the night, all one can hear is clatter of hoofs."

Similarly in Buftea, aircraft were not considered a problem at night, but discos and dogs were.

"The dogs bark at night, when there is silence everywhere, but the plane flies during the day, when it's not the same thing... "

"The alarm and the dogs. These are prevalent. The plane flies, it takes less than a half a minute to pass over. There are ten or twenty at the most in 24 hours. But the alarms at night... And the dogs... when they start, you can't do anything.. "

"During the night, one can hear them less, because one is almost asleep, is inside and almost asleep... compared to the noise outside, when he is awake. But during the day one is outside, can hear them..."

Residents of Tunari and Otopeni, although much closer to the runways did not find general aircraft noise at night a problem, although military helicopters were a nuisance;

"They pass rarely at night, it seems there aren't any planes at all, during the night.

"We don't mind them, because we are asleep."

I have been hearing just those training helicopters, which bother me during the daytime. The military ones. Sometimes they pass at night and they drive me crazy.”

“And during the night we sleep and we cannot hear anything”

Variations

Certain aircraft caused levels of annoyance over and above the usual where these were noticeably louder, off course, or lower than usual. To many, it is not just that the increased noise level of particularly low flying aircraft that causes more intrusion, but that it instils a fear that something is wrong and the aircraft might crash – this was a very prevalent view in Romania.

“When there was that strong noise, when the aircraft fell over Balotesti, it gave us a sensation of fear when we heard that loud noise... “

“When I see an aircraft flying low enough, I think immediately: isn't it falling over me? We got scared. I am very afraid when I see an aircraft ... My God, what if something happens? You see, it is safety reason.”

“I am nervous if I hear one very noisy. I can imagine it crashing over me.”

Where an aircraft is off course, and generating a higher than usual level of noise, this causes annoyance because it is seen as the airlines 'cheating'

“I am not an expert, but I think there is often so much traffic that they don't wait for their order from the tower, and they detour their route and fly right over our village, our houses and therefore the noise is louder. And it's more and more that way”

“When they don't respect their route and really fly over the houses, and there is also this fear that one day or another one of them might fall on our heads! When they detour from their route and fly over, it's stressful”

In all countries, certain aircraft had acquired notoriety for standing out above others in the amount of noise the generated. In the UK and Romania was appreciated that improvements in aircraft design and newer fleets had contributed to lower levels of aircraft noise than in previous years, but this allowed the older aircraft to stand out more.

In Manchester the PIA flight was an instance mentioned by four of the groups where the noise from aircraft regularly becomes a disturbance. Comments about the PIA flight included;

*“its just a standing joke, everybody knows when it is coming over”
(Wythenshawe)*

“Could be the frequency. Because it's [PIA plane] a very low frequency noise that one” (Heald Green)

*“that's the one that actually vibrates your windows, that PIA type noise”
(Heald Green)*

*“[the PIA flight] comes in three times a day and it makes life a misery”
(Stockport)*

“It’s quiet. I’m having a shave in the bathroom and they are over there. And I can see them coming in and I have no problem with it but as soon as that PIA comes in everything vibrates” (Heald Green)

“Our house backs onto the railway virtually and I think I probably notice that more than the planes. It’s just the occasional low flying ones ... it’s like subconscious” (Heald Green)

The quality of the noise produced by the PIA flight in being of such low frequency that it is ‘felt’ as well as heard is evidently a key feature of why it produces such a reaction.

In France, it was Air Algeria that provoked this reaction and in Romania the Tarom aircraft are noted as being noisier than the equivalent newer ones of Alitalia even though they are the same model.

Exercise 2 – Annoyance Ratings

Respondents were then asked to listen to 5 aircraft sounds. All groups listened to the ISIS sound simulation in the same order;

1. B747 400 departing
2. A320 departing
3. B747 400 arriving
4. Lear 25 departing
5. B737 300 departing

Respondents were asked to rate sounds in terms of annoyance and loudness, and describe the sounds heard.

The ratings were given on a 0 to 10 scale and the results are presented below.

Table 5.2 Average Scores From Exercise

| | Aircraft Type and Operation (A= Arrive, D= Depart) | | | | |
|-----------------------------------|--|--------------|-----------------------|---------------|-------------|
| Loudness Score | 747- Depart | A320D | 747Arriv e | Lear D | 737D |
| Romanian Average | 5.12 | 1.16 | 7.64 | 4.72 | 2.34 |
| UK Average | 7.68 | 4.6 | 9.4 | 7.68 | 4.34 |
| French Average | 8.41 | 3.75 | 9.04 | 7.50 | 5.07 |
| Annoyance Score | 747- Depart | A320D | 747Arriv e | Lear D | 737D |
| Romanian Average | 4.32 | 0.72 | 6.72 | 4.02 | 1.66 |
| UK Average | 7.12 | 3.76 | 9.14 | 7.02 | 3.8 |
| French Average | 8.37 | 3.43 | 9.29 | 7.84 | 5.10 |
| Sound Meter Peak (dBA) | 747- Depart | A320D | 747Arriv e | Lear D | 737D |
| Romanian Average | 83.1 | 63.2 | 88.1 | 83.8 | 67.4 |
| UK Average | 82.1 | 69.1 | 86.9 | 83.6 | 68.8 |

| | | | | | |
|----------------|---|---|---|---|---|
| French Average | ? | ? | ? | ? | ? |
|----------------|---|---|---|---|---|

The average scores for each group for both loudness and annoyance are shown in Table 5.2 and on Figure 5.1 below, on a scale of 0 to 10. Also shown is the sound level at which the aircraft noise was played back, where available.

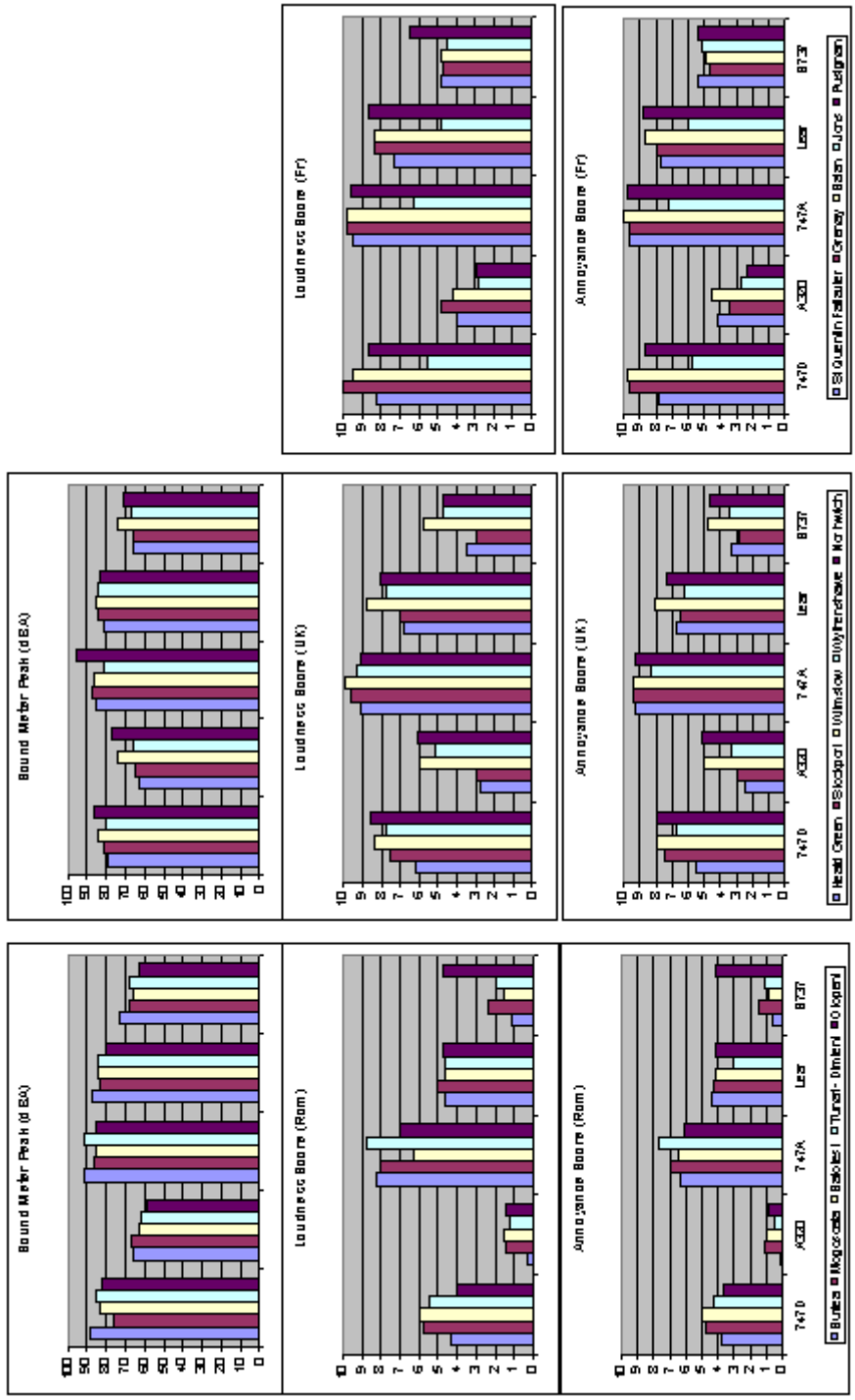
This shows that the play back levels varied at each group, but within a fairly narrow band, and in general maintained the same relative levels. For example, in the UK groups, the Northwich group heard the recordings at slightly higher levels than the other groups. The average sound levels replayed at the UK groups and the Romanian groups were broadly similar. Unfortunately there were no sound meter reading recorded at the French groups and this makes comparisons of the scores difficult. However, the ISIS program will have ensured, that providing amplifier volumes were not changed through the exercise, the aircraft noises relative to each other would have been the same. It should be noted that measuring sound levels with a sound meter is not precise and can only be taken as a guidance only.

Considering the sound levels at the Romanian and UK groups, on average these were very similar, but produced higher average scores from UK respondents than from the Romanians, for both loudness and annoyance. For three of the five aircraft types the average scores from the French groups for loudness were higher than those from the UK, but overall the French and UK scores differ very little. For annoyance however, there are differences between the three countries, with the UK respondents scoring typically 2.7 points higher than the Romanians, and the French 3.3 points higher than the Romanians.

In the analysis of these scores, it should be remembered that the amount of data is small, with typically eight respondents from each of five groups. However, the graph shows that the relative response in terms of loudness and annoyance of the aircraft noises played is the same across each country, with the A320 being considered least loud and least annoying everywhere, and the B747 (Arriving) being considered loudest and most annoying everywhere.

This shows that the responses are broadly consistent, but that the Romanians appear less likely to find the same noises as annoying as people in the UK, who find them slightly less annoying than the French – **assuming that the French groups heard the noise at a similar level**. It should be noted however, that the respondents around Lyon may be no more representative of the French population as a whole, than the respondents from Manchester are of the UK. There are likely to be local conditions that contribute to the annoyance, for example, Manchester is far more urban than the corresponding survey area at Lyon.

Figure 5.1 Sound Demonstration Exercise Scores



The qualitative descriptions of each of the different aircraft noises heard were very similar from all countries.

Table 5.3 Descriptives of B747 400 Departing Aircraft Noise

| | |
|--|---|
| UK 79dBA to 86dBA | <p><i>Intense in middle /High pitched/ Constant/Rumble</i></p> <p><i>Screech/Woosh/Distant Whirring</i></p> <p><i>Headache noise/ echoing engine noise</i></p> <p><i>Too long – ‘in your face’/long lasting/penetrating/drone/ high pitched whistle & drone/very unpleasant/grating intrusive whine/high whine/vibrating/heavy sound</i></p> <p><i>Penetrating noise/booming/screeching</i></p> <p><i>Long/roaring/whistling/echos/loud and long/long lasting/booming/crescendo/ whistle</i></p> |
| Romania 76dBA to 89 dBA | <p><i>Tolerated/Disturbing in the night</i></p> <p><i>Not disturbing/Increase/Powerful/Acceptable/Normal/V. loud/V. sharpened</i></p> <p><i>Normal/A little bit loud/Like a thunder/Like a motorcycle/V. rarely/It’s not disturbing/V. loud</i></p> <p><i>Not disturbing/Acceptable/A little disturbing/Normal/Tiresome</i></p> <p><i>Acceptable/A little far/Easy to be supported</i></p> |
| France | <p><i>it’s really loud, very strong, it’s very aggressive, violent, to start with it’s ok then it gets really loud, it’s progressive, you can hear the motors push, you can actually hear it accelerate</i></p> <p><i>the noise goes on for a long time, it’s long and deep, the volume goes steadily up and lasts for a long time</i></p> <p><i>There are more base tones in it, deep sounds, like a heavy purring sound, deep strong hum in the background</i></p> <p><i>you can here the motors working, they are whistling, all of a sudden there is a tearing noise in the motors, a long high pitch whistle, high pitched, piercing</i></p> <p><i>I find it’s really unbearable, it’s very stressful, very difficult to stand, gets you up tight, very tiring, you couldn’t even think if you have that over head</i></p> |

Table 5.4 Descriptives of A320-Departing Aircraft Noise

| | |
|------------------------------------|---|
| UK 63dBA to 77dBA | <p><i>Quiet/ Smooth/Tolerable/ Gentle/Humming</i></p> <p><i>Acceptable gentle/quiet but ‘tinny’ noise/horrible sound</i></p> <p><i>Muffled/distant – still too much noise to live with/ peaceful/ not intrusive – easy to ignore/low note/fairly quiet in distance</i></p> <p><i>Whining/ deep bellow/ further away/grinding</i></p> <p><i>Air/ same sound for longer/soft but heard for longer/ softer/ slower</i></p> |
|------------------------------------|---|

| | |
|--------------------------------------|---|
| Romania 58 to 67dBA | <i>V. lower/Pleasant/Not disturbing</i> <i>Not disturbing/Lower/Acceptable/Far off/Pleasant/V. quiet</i> <i>Normal/ V. loud /Like a TV/V. lower/ a little bit disturbing</i> <i>Not disturbing/A little bit noisy/Relaxant/Acceptable/Unimportant</i> <i>Thin/Acceptable/Plugged</i> |
| France | <i>It sounds like the plane is higher up, it's more far away, it's less intense, not as strong</i> <i>you feel it disappears more quickly, it doesn't last as long</i> <i>It's almost the same all the way through, you would get used to is, there is less of a crescendo, the sound gets to a constant pitch very quickly, there are less variations in the sound</i> <i>you can still hear the base sounds but they are softer, the sounds are more muffled, calmer, more like a long roaring sound</i> <i>There are not piecing whistling noises, no deep heavy noises</i> <i>it's more bearable than the others, less aggressive, less violent, it's softer, more acceptable, not very noisy, less vibrations</i> |

Table 5.5 Descriptives of B747 400 Arriving Aircraft Noise

| | |
|--------------------------------------|---|
| UK 85dBA to 96dB | <i>Intense / Harsh /High Pitch / Annoying/ Noisy /High frequency</i> <i>Piercing / Grating / Painful</i> <i>Deafening/ v. annoying/ screaming/ loud/ repetitive/ shriek</i> <i>Piercing – could not live with/ ridiculous – loud – intrusive/ piercing howl/ screeching/ intolerable/ ringing/ grating/ penetrating/ very loud hard noise/ rapid modulation/ piercing/ whistle/ sharp</i> <i>High pitched screech / High/ rattling/ tinny/ screeching/ high rattle/ very close/ high pitched squeal</i> <i>Vibrating/ High pitched/ Quicker/ Piercing/ Grating/ high pitched/ drawn out/ piecing/ loud</i> |
| Romania 85 to 92dBA | <i>V. loud/Noisy/Disturbing/Annoying/Powerful / Acceptable</i> <i>Not disturbing / Powerful / Acceptable / Hard to support /V. loud / Unbearable / V. deafening</i> <i>A little bit plaguing / Loud / Acceptable / Like a scream / It's heard every day / Disturbing / It's heard rarely</i> <i>Enough disturbing / Noisy / Annoying / Disturbing / V. disturbing</i> <i>Noisy / Disturbing / Frequent / Near / Powerful</i> |

| | |
|---------------|---|
| France | <p><i>Deafening, it's very very noisy, extremely aggressive, it's there and it's deafening almost straight away, it's violent, even more aggressive</i></p> <p><i>there is a whistle, a piercing whistle, a high pitched noise, it's terrible a high pitched noise, piercing, more high pitched like a type of whistle, terrible whistle, like metal scratching together</i></p> <p><i>it's really bad for the eardrums, makes your ears hurt, it's really awful, it hurts my ears, you'd have to put your hands over your ears</i></p> <p><i>It's terrifying, you get the impression it's just above your head, very stressful, it's terrible, like it could kill you, goes right through your body, it makes your heart beat fast, you want to shoot the plane down</i></p> |
|---------------|---|

Table 5.6 Descriptives of Lear 25-Departing Aircraft Noise

| | |
|--|--|
| UK 81dBA to 83.8dBA | <p><i>Annoying / Constant Pitch / Constant Rumble / Turbulent</i></p> <p><i>High Frequency / Erratic / Pulsing /Throbbing noise</i></p> <p><i>Not too loud/ not too annoying</i></p> <p><i>Went on and on and on/ changes in pitch and noise/ long lasting/ bizarre – would be worried about that plane/ intrusive deep sound/ thundering noise/ seemed very close – quite worrying/ annoying</i></p> <p><i>Very Rough and Throaty/ whispering then booming/ rocket/ roar</i></p> <p><i>In waves/ Engine firing/ noise drawn out and consistently loud</i></p> |
| Romania 80 to 88dBA | <p><i>Normal / Noisy / Acceptable / Perceptible /</i></p> <p><i>Disturbing / Loud / Acceptable / Deafening /</i></p> <p><i>Normal / Lower / Like a train / Like a TV with out signal / Acceptable</i></p> <p><i>Little disturbing / Unimportant / Acceptable / Rarely /</i></p> <p><i>V. noisy / Normal / Acceptable / Beyond the wind speed / Forceful / Supersonic</i></p> |
| France | <p><i>it's uneven not the same volume all the time, like a long unsteady wind bowing, you can hear different sounds, different pitches, more undulating, more constant, its more irregular</i></p> <p><i>You can hear it gradually build up, it goes on for quite a while, quite long but less piercing</i></p> <p><i>you can hear quite high pitched then a low muted sound, very high pitched whistle</i></p> <p><i>it's definitely not as strong as the others, it's more steady and less loud, less aggressive, much less aggressive</i></p> |

Table 5.7 Descriptives of B737-Departing Aircraft Noise

| | |
|--|---|
| <p>UK 66dBA to 71dBA</p> | <p><i>Nice and quiet / None noticeable/ Smooth/ Gentle</i></p> <p><i>Humming/Reasonable Level</i></p> <p><i>Acceptable/ High Aircraft noise/ quiet/ not too loud – would not interfere with TV viewing/ echoing ‘ambient’ airplane noise</i></p> <p><i>Screeching/ further away – more palatable/ peaceful/ muffled/ Sounded further away/ much softer noise/ easier sound to live with/ far distance</i></p> <p><i>Smoother/ Quieter/ quiet and unobtrusive/ smooth</i></p> <p><i>High Pitch/ whistling/ reasonable expectation of noise/ squeaky/ quite low</i></p> |
| <p>Romania 63 to 73dBA</p> | <p><i>Pleasant / V. lower / Acceptable</i></p> <p><i>Not annoying / V. low / Far off / V. quiet</i></p> <p><i>Normal / Not disturbing / Lower</i></p> <p><i>Not disturbing / Acceptable / Relaxant / Unimportant</i></p> <p><i>Easily supported / Plugged / Departing / Rarely / V. loud</i></p> |
| <p>France</p> | <p><i>Not too loud</i></p> <p><i>There is a definite progression but it’s never deafening, it’s quite bearable, not too loud</i></p> <p><i>it’s changes slightly but there isn’t an explosion, it’s quite a regular sound</i></p> <p><i>you can hear the base sounds again, the base sounds make you tremble, you can here the base sounds they’ll make the windows vibrate, your heart will react to this one, it makes me shake</i></p> |

There are several factors associated with plane noises;

The volume of the sound

“Some planes are really loud, in summer it’s at least twice as loud, it’s very intense you can hear it coming from far of, the charters are very loud, cargo planes are loud, when they are taking off the sound is very loud you can really hear the engines, it’s the number of decibels which count, over 95 decibels your ear drums start being affected, when it’s too loud it starts playing on your nervous system, there is a certain level you just can’t go over”

The pitch of the sound

“There is a crescendo with very loud high pitched sound, in summer in particular you hear this high pitched sound, it’s the pitch when it’s very high pitched it’s unbearable and when it’s too low pitched its the same”

The vibrations created by the sound

“Certain cargo planes which have a heavy sound that goes up and down and make the windows vibrate they are the worst as they are always either late at night or early in the morning and the house shakes, the concord which makes the whole house vibrate, when

the Russian planes fly over the whole house shakes, even the window vibrate, its the base pitch which are the worst because they cause vibrations”

The variation in the intensity of the sounds

“I dislike it when there is a wavering sound that comes and goes, a noise varies in intensity, I feel stressed out when I hear the reactors are speeding up, at one stage the reactors seem to break and there is a tearing noise which is extremely stressful, it’s piercing, it’s an aggressive sound, it depends on how they are pushing the motors, when they are against the wind it’s worse, when the planes get old the motors slow down and the sound becomes almost pulsating it’s really aggressive, when a noise is on the same pitch and doesn’t change you don’t hear it as much, a regular sound is easier on the ear ”

The length of the sound

“It seems to carry on for a long time from when you first hear it, its the volume and the length which is a problem, it depends ho long it goes on for”

Volume particularly, and pitch constitute the two main factors of annoyance of noise, but a noise is only a nuisance when it is an intrusion.

Stated Preference Development

Introduction

One of the ultimate aims of the research is to derive values for noise from aircraft through Stated Preference (SP) analysis.

SP is a technique which attempts to reveal the relative value people place on the attributes of a product or service. In an SP experiment, the respondent is presented with a set of possible alternatives and is asked to make a choice between the different options presented. From the data collected, inferences can be made about the relative values people place on the different attributes of the alternatives being tested. These valuations can be reported for the market as a whole or for different market segments. SP has advantages over more simplistic rating scales because with SP the choice is made in the context of the package of attributes, in which there are trade offs between the alternatives on offer.

The SP design team had some initial thoughts on how the SP might work which were to be explored and developed through the course of the focus groups, with the qualitative research providing the context for aircraft noise within other quality of life issues associated with airports.

Trade Offs

More Quieter Planes or Fewer Louder Planes

In any scenarios where the total number of planes, quieter or otherwise in either option was presented, this often caused a response not to increased noise, but to other factors, particularly the prospect of more pollution or an increased safety risk.

“With potentially more planes coming there’s more chance of an accident” (UK)

“I’d say less planes because no matter .. it’s still going to create the air pollution so I’d say less planes” (UK)

“are you not getting more pollution if you’ve got 15 planes going in and out, rather than three?” (UK)

Where these other issues were not considered, there were mixed responses. The key point was just how quiet the ‘quieter’ planes would be; if they could not be heard, the number of them was not an issue, that is, more planes need not necessarily mean more noise, in terms of intrusion.

“Several little ones, if they aren’t noisy, they don’t disturb anybody (Grenay)

“it’s the noise intrusion, if there were quieter aircraft, there would be no complaints from anybody”. (Stockport)

Frequency of planes

Again the issue of frequency of planes was closely linked with issues other than noise, for example where headways of 2-3 minutes were discussed this raised concerns of safety. The time of day, or intrusion of the noise depending on the activities being carried out was also key. If the activity or volume do not themselves trigger a feeling of 'intrusion' then frequency of flights is largely immaterial.

People from all survey areas were in broad agreement about the times of day/days of week/times of year when aircraft were more annoying, but this does not mean that they recognised times when noise was 'louder' or 'quieter', simply different levels of intrusion. All areas agreed that noise in the summer was more annoying because it was then that people were more likely to be outside, or have windows open. Similarly noise at weekends and evenings was annoying because of the activities likely to be carried out then, for example conversing, watching TV, relaxing. Night time showed some mixed responses, with some people reporting that they would sleep through them so would not mind night flights, others currently experiencing night flights but being oblivious to them, and others living in dread that the situation might arise.

The majority of respondents from all survey areas were better able to understand situations that referred to;

'a plane every x minutes'

rather than

'x number of planes an hour'.

Considerations for Stage 2

The next stage is to conduct a pilot SP survey. This is expected to be followed at a later stage with a much larger survey. There is currently a need to focus on aircraft noise and explore other environmental considerations such as air pollution at a later stage, although it should be noted that for some people this is an emotive topic and even though not presented in an SP scenario, might have an impact on their decision making.

There were a number of findings from the focus groups which need to be considered when interpreting data from the final SP package to be presented to respondents in the next stage.

- Respondents interpret the SP scenarios on the basis of their own experience and ambient aircraft noise level;
- Intrusiveness of a noise was very dependent on the activity being undertaken at the time;
- Time of year, or Season did affect the level of disturbance experienced because respondents' activities varies by time of year and also the desire to have windows open and spend more time outdoors;
- Some groups (Wythenshawe and Stockport) found it less easy understand the SP exercises;
- There is a need to keep the number of variables presented to a minimum and so there may need to be a series of SP surveys in order to include all relevant criteria; and
- Actual sound level is very important. Quality of noise is less so, and would need to be tackled separately so that the two issues are not confused.

Use of Noise Simulation Program

It has been stated that while dBA is an accepted physical measure of noise it is thought it has no real meaning to individuals. The results of the exercise conducted in the groups however may show how relative noise levels could be presented in an SP survey.

We have examined the relatively small amount of data from the five UK groups to attempt to model the relationship between the sound level measured and the annoyance scores given, with a logit model. This detailed information has not been made available from the other groups, and as shown in Section 5.7 the response was not consistent between countries.

$$A = a + bN$$

Where

$$A = \text{Annoyance level} = \log \left(\frac{\text{Annoyance}/10}{1 - \text{Annoyance}/10} \right)$$

N = Noise level in decibels

a, b are parameters to be estimated

AIRCRAFT TYPE MODEL

R squared 0.450 Coefficients t

b dBA of noise respondents actually heard .103 11.2

a Constant -7.589 -10.8

This shows that as noise increases annoyance increases (the noise coefficient is positive) is expected.

Applying this to a range of decibel levels, forecasts the following annoyance scores.

| DBA level | Forecast Annoyance Score |
|-----------|--------------------------|
| 60 | 1.92 |
| 70 | 3.99 |
| 80 | 6.50 |
| 90 | 8.38 |
| 100 | 9.35 |
| 110 | 9.76 |

It should be noted that the input data was based only on a range of volume levels of 63 to 86 and so is not reliable for applying outside this range. The scores included several annoyance scores of 10, so presumably we would have needed a higher upper limit to accommodate even louder noises.

We also attempted to produce logit models for the different locations and groups. By location, the model was not significant. By aircraft type the logit model appeared significant but again it must be remembered the range of dBA levels over which the scores was recorded was very small.

In doing this we were trying to estimate the value of the noise quality of each type of aircraft, while controlling for the actual noise level. Although the volume level is linked to annoyance, the sound type of each type of each aircraft is also linked to annoyance and the model we have developed below supports this.

The model form is

$$A = a + g + d + e + h + bN$$

Where

$$A = \text{Annoyance level} = \log \left(\frac{\text{Annoyance}}{10} \right) + \log \left(\frac{1 - \text{Annoyance}}{10} \right)$$

N = Noise level in decibels

a, b, g, d, e, and h are parameters to be estimated

Aircraft Type Model

| r squared 0.922 | Coefficients | t |
|---|---------------------|----------|
| dBa of noise respondents actually heard | 0.076 | 3.857 |
| B747 Arrival | -4.958 | -2.891 |
| B747 Departure | -5.350 | -3.292 |
| Lear Jet | -5.572 | -3.368 |
| A320 | -5.814 | -4.237 |
| B737 | -5.808 | -4.236 |

Again the noise coefficient is positive so as noise increases annoyance increases, but for a given decibel level, the B747-Arrival noise was most annoying, followed by B747-Departing, Lear Jet, with A320 and B737 giving least annoyance, and this agrees well with the descriptives given earlier.

Forecast Annoyance Scores at range of dBA levels for plane types

| DBA | A320 | B747 Departure | B737 | Lear Jet | B747 Arrival |
|------------|-------------|---------------------------|-------------|-----------------|-------------------------|
| 60 | 2.24 | 3.15 | 2.25 | 2.69 | 4.05 |
| 70 | 3.82 | 4.96 | 3.84 | 4.41 | 5.93 |
| 80 | 5.70 | 6.78 | 5.71 | 6.28 | 7.57 |
| 90 | 7.40 | 8.19 | 7.41 | 7.83 | 8.70 |
| 100 | 8.59 | 9.06 | 8.60 | 8.86 | 9.35 |

Relationship Between Noise Level Played and Perceived Loudness

Analysis of the UK groups scores showed that the scores from each group produced very similar responses. These have been compared with the data from France and Romania and this shows that the results may not be transferable.

The difficulty in replicating volume levels faithfully is an obstacle to be overcome in the SP fieldwork and needs some consideration if these types of level were to be used in an SP survey, however, having heard the noises played at these levels would be the best way of ensuring people have the same understanding of what is being portrayed.

It should be noted that the sound level meter used in these groups showed some surprising variations, and room acoustics play a big part. Locating venues which are completely free of ambient noise may be difficult in some study areas; actual aircraft were heard as well as the recordings at some of the Romanian groups. However, the qualitative descriptions of the noises were very similar from all areas, although it is not clear at what volume the aircraft noises were replayed at in the French groups.

Summary and Conclusions

Introduction

The aim of the research was to understand 'Attitudes to Aircraft Annoyance around Airports' across Europe, by defining the factors responsible for a deterioration of the quality of life for households near to airports.

Attitude surveys undertaken around three European Airports, Manchester (UK), Lyon (France) and Otopeni (Romania) have shown that differences in attitude are apparent. This survey will lead to a pilot stated preference experiment which will allow better identification of the factors responsible for annoyance, and through experimenting with new noise and emission metrics, better correlation will be sought between these and real annoyance. A more thorough study is planned for the future, once lessons learned from the pilot have been taken on board.

Factors Responsible for a Deterioration in the Quality of Life

The negative aspects of living near airports were:

- Aircraft noise (at specific times);
- Air pollution;
- Fear of reduction in house/land prices;
- Safety (fear of crashes);
- Loss of greenbelt/increased development/unwanted development; and
- Increased road traffic.

Not all these issues have equal weighting, for example safety was of greater concern to residents near Otopeni than around Lyon or Manchester. Some people recognised benefits to living near airports which mitigated the negative aspects.

The reactions to these issues across the three countries are very similar, but tolerance levels vary. In terms of noise, the qualitative descriptions of each aircraft type, the relative annoyance caused by different volumes as measured by decibels, and the types of activities most affected by noise are practically the same. Similarly, the complaints about air pollution are common to all countries. There is however a big difference in the tolerance or acceptance of the presence of an airport across the three study areas, and this is almost entirely due to the utility or disutility associated with the airport.

Consider the effect of removing the airport from each of the local areas;

For the residents in the study area at Lyon, it would appear that removal of the airport would lead to an almost perfect lifestyle – they would attain the peace and tranquillity they so desire. Here, the hostility towards environmental effects of the airport is much higher than in the other study areas because the residents perceive little benefit from the airport; few work there, it is not central to the local economy, few travel through it, and removing the airport would not be seen as a loss.

At Otopeni however, the effect of removing the airport would be to deny opportunities for economic development, remove much needed jobs, and although people might perceive improvements in air quality, the noise is far less of an issue because of ambient noise from road traffic and other sources. The residents have much more basic needs that concern them such as health care and education, to worry about aircraft noise. There is also some pride in having the capital's gateway in the locality, and the loss of airport would be considered negatively, even though few local people travel through it. One

resident of Tunari even said; *“I love it when a plane passes! Well, it is a nice feeling, difficult to explain”*.

Around Manchester, a great many people make use of the airport to travel for both work and leisure. Also, since much of the population around Manchester lives in an urban rather than rural setting, the ambient noise from other sources is far higher and removing aircraft noise would not make that much impact, and similarly the contribution of aircraft to air pollution is largely indistinguishable from that created by road traffic. The benefit to the local economy is also recognised, and again there is pride in Manchester Airport's success.

It is likely that these results are not necessarily specific to each country, but rather to the conditions at each airport, that is to say, Lyon may not be wholly representative of France, Otopeni of Romania or Manchester of the UK.

This has implications for the future development of airport sites. There will be more strongly felt opposition from rural areas, because of the significant changes in noise pollution that would occur, than from urban areas where noise is already a feature of daily life. There will be less opposition where it can be demonstrated that the local economy will benefit, and there will be less opposition where there is demand for air travel from the local population (and this will also depend on the proximity of an alternative airport).

Aircraft Annoyance

Understanding the relative importance of the negative aspects of living near airports is essential for developing the next stage of the research. Although it is the intention to concentrate on noise issues, the focus groups have shown that respondents find it very difficult to isolate noise from other aspects, particularly air pollution. This is in some ways more important than noise to many respondents, particularly the French but also in Romania, where many people rely on growing their own food supplies. Unlike the noise which comes and goes, the pollution is a permanent and visible reminder of the planes passage, representing more of a long term danger than an immediate one.

It is also important to put annoyance from aircraft into context with other quality of life issues. The budget allocation exercise showed how local issues related to aircraft annoyance. In Manchester, for example crime and traffic congestion are more important, in Otopeni, healthcare and schools rank more highly, but in Lyon, noise, and air pollution are of greater importance.

Except for Romania, there are fears about the evolution of the air traffic, and particularly so in France. In Romania, increases in air traffic are associated with better economic fortunes. Night flights would not be welcome anywhere.

In France there is a feeling of financial incertitude, as they fear the increased traffic will inevitable have a negative impact on housing prices, even if this is clearly not the case at present. This is not the case in the UK or Romania where the airport is viewed as having a beneficial effect.

“I knew the airport was there was I bought my house but there were other things I had to take into account at that time and I couldn't find anywhere else at the same price, it's difficult to find somewhere which in the middle of the countryside and right next to a major city which is relatively inexpensive, there is a real difference in the process west and east of Lyon,

Jons is a very pretty village it would be difficult to find this elsewhere at the same price”

Increased air traffic carries the perceived increase in danger from crashes, a view held in all three countries.

“I am always afraid that one of the planes will crash, it's inevitable one day there'll be a crash, when you see the number of planes waiting to land one behind the other you think that one day it's inevitable that they'll collide, there is always a danger, when you see an accident on the television you can't help thinking that it can also happen here, If I lived in Jons I don't think I would be as frightened because they have already taken off, they even fly over the school now which they didn't used to do it's frightening”

Noise Annoyance

The surveys have identified factors responsible for annoyance;

- The volume of the sound;
- The pitch of the sound;
- The vibrations created by the sound;
- The variation in the intensity of the sounds; and
- The length of the sound.

Volume is easily the most important of these, but annoyance is tempered by many other factors, which are difficult to measure.

A person's response to a given sound level in terms of annoyance is a variable, not a fixed quantity. The key variables affecting reaction to a particular level of aircraft noise are;

- Length of time living with a given noise level;
- Personal sensitivity – which can be;
 - fixed (a personal characteristic) and/or
 - variable (consciousness varies according to outside influences), and
- Activity – degree of intrusion.

All of the above make measuring response to noise difficult, as it is expected that results would be very difficult to replicate with the same set of people if experiments were repeated. This will need to be considered in the interpretation of results from a quantitative survey.

Length of Time Living with Noise

Of major influence on reaction to, or tolerance of aircraft noise was the length of time the person had been lived with it, with people capable of adapting to even very high levels of noise, for example as in Heald Green. This has implications for the valuations of noise used in an environmental assessment, as it would seem that those people who are subjected to the highest levels of aircraft noise value have a low value for it since they seem to 'got used to it'. In the Heald Green group one respondent (young, male) had only very recently moved into the area and was quite concerned about the level of noise he was experiencing. Other people in the same group, with the same exposure to noise

were of the opinion that it would not take the newcomer long to adapt and were all of the attitude that noise was not a problem to them.

However, while in all areas there were some individuals who had adapted to aircraft noise, in some groups, particularly in France there were some who hadn't, or ever would adapt given their hostility to aircraft.

However used to the regular levels of noise an individual had become, where there are changes in the regular patterns, or specific aircraft significantly louder than the average, these are noticed, for example, around Manchester the PIA plane is notoriously loud. Other areas mentioned how they noticed when aircraft fly lower than usual, when the wind direction changes, and when planes do not stick to their routes.

Personal Sensitivity – Personality

Aircraft and aircraft noise were not generally at the forefront of Manchester respondent's concerns in the same way as they were to some individuals, particularly in France, but also in Romania. For the same level of exposure to noise, some people were more sensitive than others, and there are no readily apparent characteristics or personality traits that explain this that could be ascertained in a group situation. They appear to be randomly spread throughout society, and from the small sample in the focus groups there was no apparent influence of affluence, level of education, age, gender or lifestyle. However, these personalities seem more prevalent around Lyon. This may be due to the current plans for a second runway, which has motivated environmental groups to campaign, which has raised awareness amongst individuals.

Personal sensitivity is also likely to be related to the perceived usefulness of the airport, which was far lower at Lyon than in Manchester.

The reactions to different aircraft types with quite distinctive sounds showed that some people were less averse to some sound qualities than others, for example, some really disliked high pitched 'whine' type noises while others disliked deep, bass noises. The noise quality is of far less importance than volume in causing annoyance.

Personal Sensitivity – Variable Reaction

Several people in several groups, who while generally unconcerned about aircraft noise, experienced heightened awareness and sensitivity when being visited from people from elsewhere who were not accustomed to the noise. Thinking about the noise somehow makes it audible when it previously was not;

"I only notice them if you mention them" (Wythenshawe).

"I can't remember when I last heard an aeroplane in the back garden" (Heald Green).

The campaigns against the expansion of Lyon St Exupery have probably heightened awareness amongst residents there.

In measuring response to noise, this is perhaps the most difficult to deal with. (It has been the research team's personal experience that consciousness of aircraft noise has increased significantly as a result of carrying out this work!)

Activity

There were lifestyle differences in the groups in the three countries, resulting from differences in income, climate etc. For example, the Lyonnaise are able to spend considerably more time out of doors than are the Mancunians.

The degree of intrusion caused by aircraft noise depends on the amount of time spent in activities likely to be affected; including:

- Socialising outdoors (appears to include all mealtimes in France);
- Watching TV; and
- Relaxing.

The intrusion is higher in France because of the better climate, and also that in the UK, homes are more likely to be double glazed, and around Manchester, particularly in the more urban areas, there are other noise sources lessening the impact of aircraft noise.

There are reasonably consistent responses in activities by time of day, with the most noise sensitive being chiefly in the evenings and at night, as;

"During the day there's all the other hustle and bustle, but at night, things have quietened down" (Wythenshawe).

"When you've got the patio door open and you're watching the television and then the frequency of them coming in is such that it interrupts your enjoyment of the programme" (Heald Green).

Once there is an awareness, and intrusion of noise, then frequency of the noise event becomes important. At times of day when the noise is not noticed, the frequency is unimportant, but then more often an activity is intruded upon the more annoying a given sound level becomes.

"its annoying when]...it's one after another. At a particular time. And you get one and you're having a conversation in the garden and it's a pleasant evening ...I think that's when you notice it" (Heald Green).

Conclusions

Measuring annoyance will need to take into account several factors:

- The ambient level of noise currently experienced on a daily basis by the individual, and reaction to sound levels relative to this;
- The length of time the person has lived with the level of noise, and whether this was by choice or not;
- Amount of time the individual spends carrying out 'intrusion-sensitive' activities, by time of day, day of week, time of year, for example, watching TV with windows open, speaking on phone, etc. This is likely to be very weather dependent; and
- Heightened awareness of noise as a result of research – this may need repeating parts of a survey to measure how response to the same noise has changed over the course of an interview.

Considerations for Stage 2

The next stage is to conduct a quantitative survey including a pilot SP survey. This is expected to be followed at a later stage with a much larger survey. There is currently a need to focus on aircraft noise and explore other environmental considerations such as air pollution at a later stage, although it should be noted that for some people this is an emotive topic and even though not presented in an SP scenario, might have an impact on their decision. From the qualitative research, we would suggest some questions to include in the SP surveys.

It is expected that the Stage 2 surveys would collect the following information;

- Demographic information, (Age, gender, SEG, employment status, life stage)
- Attitudinal Information (reasons for moving to/living in area, importance and performance scores for aspects of local environment)
- Lifestyle questions, (including employment status, hobbies, how leisure time spent, where etc, membership of organisations)
- Residential information (address/postcode, how long at same address, within same location, features of residence, eg double glazing, proximity to main roads/motorways/rail routes, urban/rural)

The SP part of the survey would include some of the information gathered above, but it is expected that the results of the other quantitative data collected would in itself be valuable. There may need to be more than one SP type in order to measure all the different variables. It might be possible that more than two SPs could be needed in order to cover issues that may not be comparable between different countries, although a wholly consistent approach might be preferable.

Variables to include in SP scenarios

People have their own reasons for living where they do that they trade off against other aspects, particularly house price (people will generally buy the 'best' they can afford), but there are other aspects such as proximity to friends and family, and also staying in the place one was born in. What determines the 'best' however is a personal thing. In terms of how this could be valued, one idea might be council tax, however, it is questioned whether this would transfer to other parts of Europe. Also, the cost of living in an area will depend not only on council tax but whether buying, renting etc, and again finding values applicable to all Europe will be difficult.

People did not give consistent responses for spatial or temporal situations for noise differences, and were unable to think of noise in terms of proportionate change. While it is appreciated that there are uncertainties involved with realistically representing noise levels with simulation, the research has shown that there were reasonably consistent responses to bands of volumes that could be described as 'very loud' to 'quiet'.

There were noise qualities of different aircraft sounds that provoked comments. The B737-Departing aircraft noise when replayed received fewest negative comments from most groups. By playing this aircraft sound at different levels, it would be expected that people could respond to this with a high degree of consistency. The actual levels that could be agreed upon as 'quiet', 'loud', 'very loud' etc are less clear combining findings from all three countries than at first appeared the case from the UK groups alone, particularly as we have no volume levels to relate information to from some of the groups.

However, sound levels of around 60dBA are likely to be agreed to be 'quiet', and above 95dBA 'very loud', although a level between these two could be contentious.

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