

AIR QUALITY

WHAT IS AIR QUALITY?

Pollutants released into the atmosphere by activities such as transport and power generation affect the quality of air. Airports are one contributor to this, but by no means the only one, the largest single contributor in the UK currently being road traffic.

High levels of pollutants in the air can harm human health and the environment. Although everybody is at some risk when air pollution is high, people with existing lung diseases or heart conditions are at greater risk especially if they are young or elderly.

SOURCES OF EMISSIONS

The pollutants released at airports can be categorised into the following main sources:

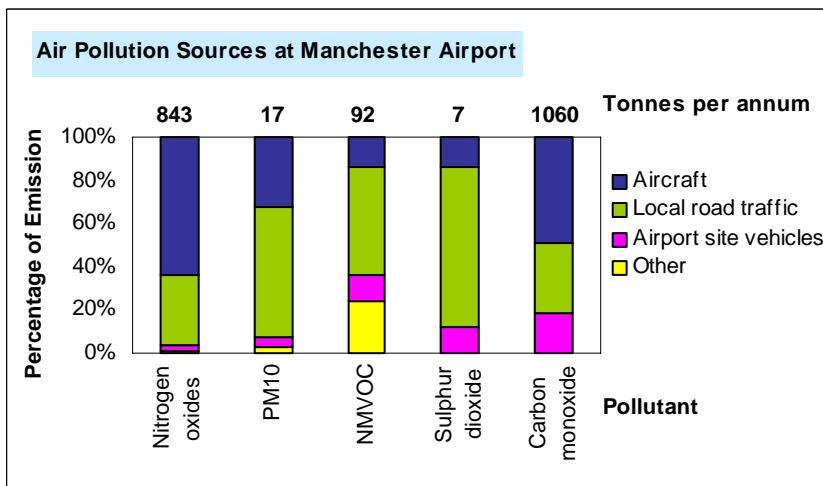
Aircraft: engine emissions during taxiing and in the air, during testing on the ground; an aircraft's auxiliary power unit (on-board generator) whilst being prepared for flight.

Local road traffic: non-airport related vehicles (70-90%) and airport related vehicles (10-30%) on local roads such as the M56 motorway.

Airport site vehicles: airside and landside vehicles; ground support equipment, car parking.

Other: boiler houses: evaporative emissions from fuel storage tanks.

Each source of pollutants releases different amounts of a range of pollutants. Examples of pollutants that are often monitored at airports are nitrogen oxides (NOx) and PM10 - fine particulate matter (dust).



GOVERNMENT POLICY

In May 1999 the Government published 'A Better Quality of Life: A Strategy for Sustainable Development for the UK'. This Strategy puts the environment, social progress and the economy alongside each other at the heart of policy making.

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Within the Government's Sustainable Development Strategy, urban air quality was identified as one of the key challenges. The UK Air Quality Strategy (AQS) published in January 2000, addresses this challenge by defining air quality limits that must be met by 2005. The AQS also implements the requirements of the EU Air Quality Framework Directive that proposes more stringent air quality limits to be achieved by 2010.

AIR QUALITY STRATEGY (AQS)

Every 3 years, local authorities are required to review their areas to assess whether air quality limits will be met by the appropriate dates (2005 and 2010). Air quality limits have been set for 7 pollutants for the protection of health. European Union legislation will require limits for additional pollutants in the future.

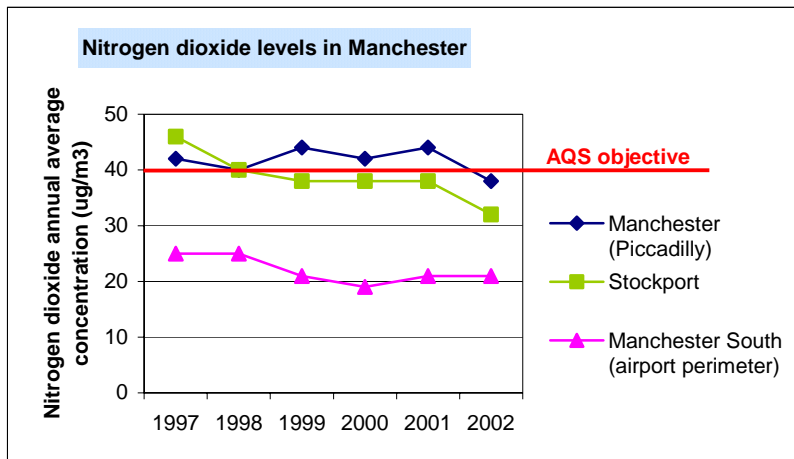
AQS limits have been set for Benzene; 1,3-Butadiene; Carbon Monoxide; Lead, Nitrogen Dioxide, Particulates (PM₁₀) and Sulphur Dioxide. Ozone is a pollutant not included in the AQS because the effect of ground level Ozone concentrations is a national and regional issue and is being considered at this level rather than at a local authority one.

Where air quality limits are expected not to be met then a local authority is required to declare an Air Quality Management Area (AQMA) and draw up an action plan to reduce emissions.

The Greater Manchester AQMA was declared in 2002 and covers a large part of the urban centre and also includes some of the busy roads and motorways in the region. The boundary of the AQMA was defined by areas where the limit for Nitrogen Dioxide was expected to be exceeded in 2005.

WHAT IS AIR QUALITY LIKE AROUND MANCHESTER AIRPORT?

Manchester Airport, jointly with Manchester City Council, operates a sophisticated air quality monitoring station that forms part of a national network. The monitoring station is located at the Airport perimeter in Moss Nook and has measured levels of Nitrogen Dioxide, Particulates, Sulphur Dioxide and Ozone since 1997. Up-to-date air quality levels at this site, called 'Manchester South', can be obtained on the Internet at www.airquality.co.uk.



Monitoring results show that air quality limits have not been exceeded in any year since monitoring began. Air quality monitoring cannot distinguish between the contribution made by different sources of pollutants. Other air quality studies have shown that levels at the airport perimeter are a combination of non-airport related and airport related sources. At the Manchester South site, 47% of the annual average Nitrogen Dioxide concentration is from Airport related sources with 53% being non-airport related sources, primarily non-airport road traffic.

Manchester Airport is not included in the Greater Manchester Air Quality Management Area. The adjacent M56 is included in the AQMA.

WHAT WILL AIR QUALITY BE LIKE IN THE FUTURE?

The replacement of older vehicles and aircraft with newer ones will reduce their emissions. Tighter emission controls on vehicles and aircraft are being put forward by international bodies which will reduce the emissions they produce. However, the Airport is becoming busier and 40 million passengers may be using the Airport each year by around 2015 (currently 22 million) and it is possible that these improvements could be off-set by the growth of the Airport.

Manchester Airport is working with the local authorities surrounding the Airport (Manchester City Council, Stockport MBC, Trafford MBC, Macclesfield BC and Cheshire County Council) in carrying out their 3 year air quality reviews. Work carried out to date shows that current air quality limits will not be exceeded in 2010 at the Airport.

As part of its long-term planning for the industry, the Government published in 2003 a consultation paper titled 'The Future Development of Air Transport in the UK'. This paper has led to a number of studies being undertaken by the Government to determine the air quality levels at UK airports in 2015 under a range of different growth scenarios. The studies at Manchester Airport concluded that current AQS limits will be met in 2015.

HOW ARE AIRPORT EMISSIONS BEING REDUCED?

Manchester Airport has a policy to control local emissions to air where practicable. The Airport's policies and targets on air quality are presented in the Manchester Airport Environment Plan (published in 2004 and available on the Airport's web site). As well as reducing emissions from our own operations, we promote industry best practice with other companies who are based and work at the Airport to reduce emissions. We also support the action plan being developed by the 10 local authorities of Greater Manchester.

ODOUR

AVIATION ASSOCIATED ODOURS

The fuel smells associated with airports are derived from the incomplete combustion of aviation fuel (kerosene) when emissions of hydrocarbons evolve which have a characteristic odour. The mixture of these hydrocarbons produced is very complex and the concentrations are very low, often below the limits of detection of the most sophisticated instruments. The human nose is very sensitive to smells and can detect these very low concentrations in the air.

DISPERSION OF ODOURS

Weather conditions will have an impact on the dispersion of odours and therefore the strength of odour and areas affected will be variable. Changeable weather conditions explain why odours are more noticeable on some days and not at all on others.

Airport operations can also have an effect on where odours arise and are subsequently dispersed. Aircraft are not likely to produce significant amounts of odour when they are in the air. The main sources of aircraft odour are aircraft taxiing, engines idling and starting up, together with the use of the aircrafts' auxiliary power unit (on board generator).

HEALTH EFFECTS OF ODOURS

Pollutants known to have an effect on are controlled by air quality limits set by the European Union and the UK government. The monitoring of air quality at the Airport shows that these limits are not exceeded. At the very low concentrations that odours occur at the airport they are below the threshold of any known health effect.

A difference between poor air quality and odour is that poor air quality can arise when the air is odourless. Conversely, when odour is present, the air quality can be good in terms of human health impacts, for example after farm yard muck spreading.

REDUCING THE INCIDENCE OF ODOUR

The Airport has taken steps in terms of operational procedures to enhance air quality and reduce odour events:

- Where possible aircraft systems aboard aircraft on the ground are powered by the Airport's electricity supply, in preference to the switching on of the aircraft's auxiliary power unit.
- Aircraft engine running on the airfield is minimised as part of the efficient operation of the airfield.
- Fuel spillages are quickly cleaned up to minimise any odour from this potential source.

WHAT WILL ODOUR BE LIKE IN THE FUTURE?

Advances in aircraft fleets will bring about significant benefits as the more modern aircraft have much lower exhaust emissions both in flight and during taxiing on the airfield. So whilst there will be increases in the number of aircraft using Manchester Airport in the years to come odour episodes should not be adversely affected by this.

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FUEL JETTISONING AND OILY DEPOSITS

DO AIRCRAFT JETTISON (DUMP) FUEL?

Only in emergencies. In fact, only certain types of aircraft have the need and therefore ability to jettison fuel. The need to dump fuel is governed by the difference between the gross take off weight and maximum landing weight of the aircraft. If the difference is small then the aircraft does not need to jettison fuel and will not physically be able to. Only some of the large, long haul aircraft are able to jettison fuel.

WHEN DOES FUEL JETTISONING OCCUR?

Fuel jettisoning is limited to emergencies and only when there is no time to use up surplus fuel by circling. There are safety implications with jettisoning fuel because of the potential ignition of the fuel vapour and therefore it is only carried when necessary.

Fuel jettisoning is very rare, with perhaps 50 incidents per year across the whole of the UK. The Civil Aviation Authority records all such occasions.

PROCEDURES FOR JETTISONING FUEL

The decision to jettison fuel is made by the pilot and although the pilot will aim to avoid populated areas and prevent any impact of fuel at ground level the overriding issue is the safety of the aircraft's passengers and crew.

Air traffic controllers are advised to assign the aircraft to airspace in which the fuel can be jettisoned. If at all possible this is over the sea and over 10,000 feet above the ground to minimise the risk of the fuel reaching areas of population. Exceptionally, if this is operationally impracticable or inconsistent with safety, fuel may be jettisoned above 7,000 feet in winter and above 4,000 feet in summer. For fuel to be jettisoned below these levels the situation must be critical and unavoidable.

The aircraft will be instructed to fly at a minimum of 500 km/hour. At this speed the turbulence behind the aircraft will ensure most of the fuel released is vaporised into a fine mist. This 'mist' will remain in the atmosphere until it has been broken down by the sun's energy into carbon dioxide and water. Only a minimal amount of the jettisoned fuel will actually reach the ground.

IF AIRCRAFT JETTISON FUEL ONLY RARELY, WHAT IS THE TRAIL I CAN SEE FROM THEIR WINGS?

When humidity is high, water vapour can be seen to create a mist behind the leading edge of the aircrafts' wings. Also if an aircraft has been standing in or flying through rain then water deposits can build in the flaps and control surfaces on the wings. This water will be driven out on landing or taking off.

OILY DEPOSITS

Manchester Airport occasionally receives complaints regarding 'oily deposits' found on the ground, on garden furniture or on ponds. The Airport continues to respond to these complaints, and when deemed appropriate, will send samples for independent analysis. Of the samples so far analysed none of the substances tested have been attributed to aviation. The sources of contamination are likely to be biological in nature; tree sap, insect or bird deposits.