

Air quality monitoring results

2018

This document provides the results of air quality monitoring undertaken at and near to Manchester Airport in 2018. It also explains where and how we monitor air quality. Information is also provided about Government's health-based air quality objectives.

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Air quality monitoring at Manchester Airport

Overview

We provide information about air quality and airport-related emissions on our website www.manchesterairport.co.uk/emissionsinfo. Here you can find our Emissions Information Pack which gives information on emissions from activities associated with Manchester Airport and how they contribute to local air quality. More information about air quality is also provided in our Sustainable Development Plan. The Sustainable Development Plan sets the airport's air quality objective which is to "closely monitor local air quality and seek ways to reduce emissions from our operations".

This document summarises the results of air quality monitoring undertaken at and near to Manchester Airport in 2018. It compares measured concentrations of air pollutants against health-based air quality objectives which are set by Government. It should be noted that this is a draft report.

Methodology

We have been measuring air quality at the airport since the 1990's. We do this in two ways:

Continuous monitoring

Automatic analysers continuously measure real-time concentrations of air pollutants. These monitors are complex to install and operate, but allow detailed analysis of air quality, where this is required. Analysers are visited by service engineers at least once a month, and are independently calibrated twice a year. We undertake continuous air quality monitoring in partnership with Manchester City Council.

The Clean Air Manchester and UK-Air websites provide near to real-time measurements of the following pollutants:

- nitrogen dioxide (NO₂)
- sulphur dioxide (SO₂)
- ozone (O₃)

We also measure particulate matter (PM₁₀ and PM_{2.5}) using continuous monitoring equipment. The results of this are reported below, and are held by Manchester City Council. The type of monitoring equipment installed does not currently allow results to be provided in real-time online.

We used continuous monitoring equipment to measure air quality at Styal Road (Site 10) until January 2016, when the equipment moved to Daisy Bank Lane (Site 14) due to redevelopment at the old location.

Diffusion tubes

Diffusion tubes measure the average concentration of pollutants over longer periods of time. Pollutants are collected in an absorbent material within diffusion tubes which are chemically analysed at a laboratory to calculate the average concentration during the time that the tube was exposed.

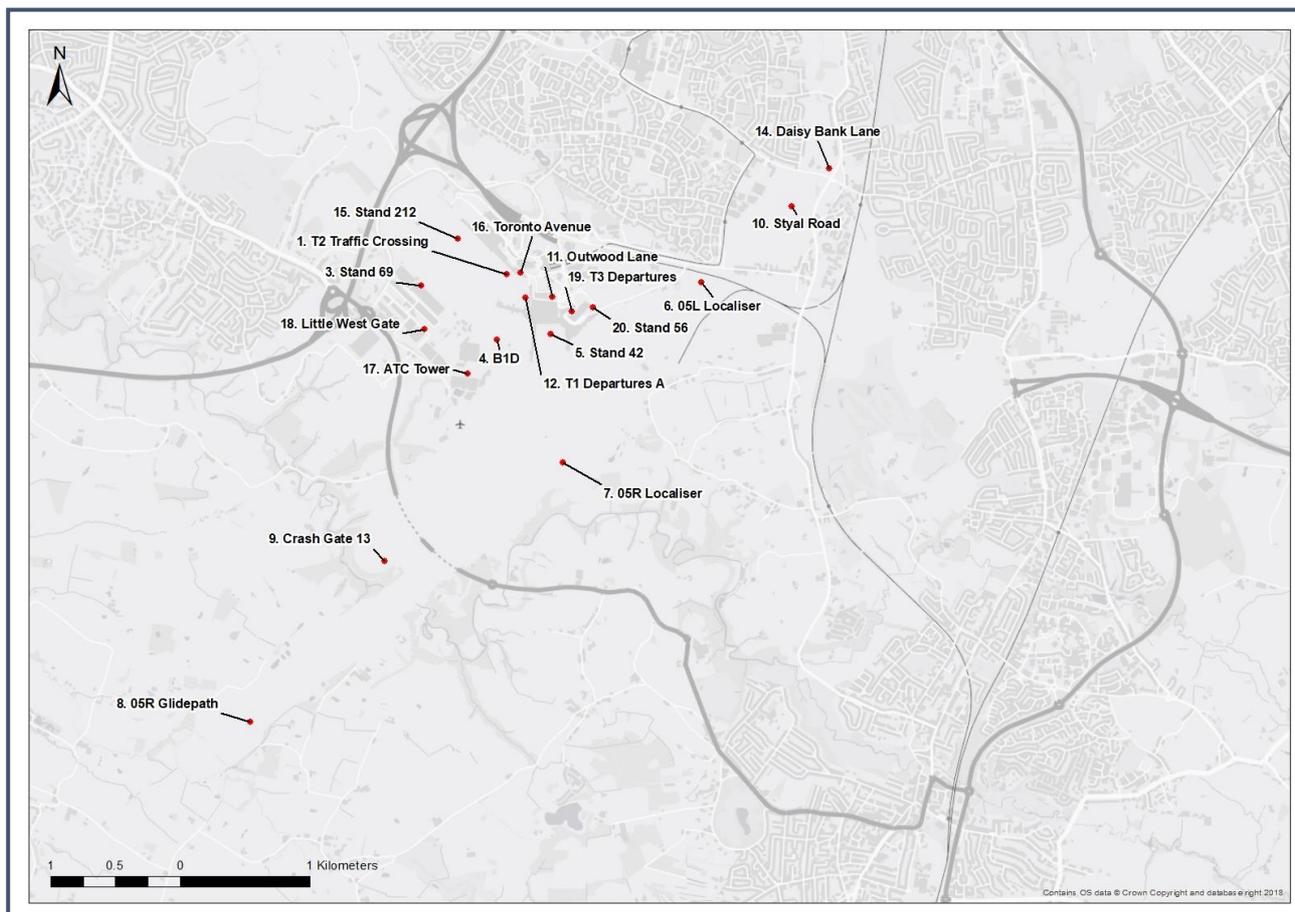
Diffusion tubes are quick and easy to install compared to continuous air quality monitors. They are useful for cost effective monitoring of air quality over a long period of time. We use diffusion tubes to measure concentrations of nitrogen dioxide (NO₂).

We have followed Government guidance and 'bias adjusted' the diffusion tube monitoring results we publish. This means that the results can be compared to other locations. We

calculate our 'local bias adjustment factor' by co-locating three diffusion tubes at the independently calibrated Daisy Bank Lane continuous monitor. The bias adjustment factor is then applied to the results of our diffusion tube monitoring. The local bias adjustment has been compared against the 'national bias adjustment factor' released by Defra in March 2019. This step compares the laboratory's national diffusion tube performance against diffusion tubes co-located at the Manchester Sharston continuous monitoring site. The 'local bias adjustment' resulted in a factor of 1.003 and the 'national bias adjustment' is 0.76. The local bias adjustment has been used as this results in more conservative concentrations for the reported diffusion tubes.

Where we measure air quality

The locations where we currently monitor air quality are shown below. Diffusion tubes are used to monitor nitrogen dioxide (NO₂) at all locations and both continuous monitoring and diffusion tubes at Daisy Bank Lane.



Air quality objectives

The Government has set health-based air quality objectives. Local authorities have a responsibility to monitor air quality and put plans in place to meet health-based objectives in areas where members of the public may spend a significant amount of time. These locations are generally homes or care homes for example. Air quality objectives do not necessarily apply in a work place, or at the airport itself as people only spend short amounts of time here.

Air quality objectives are set individually for different air pollutants. They apply to a calendar year, running from January to December. Some types of air pollution have more than one objective, although all must be met, these are often reported individually - for example:

- long-term averages which must be met over a whole year.
- short-term averages, such as hourly or daily averages, which cannot be exceeded more than a certain number of times a year.

Below are the air quality objectives for the pollutants we monitor.

Pollutant	Long-term annual objective (limit as an annual average)	Short term objective(s)
Nitrogen dioxide (NO ₂)	40 µg/m ³	No more than 18 cases of an hourly average > 200 µg/m ³ each year
Particulate matter (PM ₁₀)	40 µg/m ³	No more than 35 cases of a daily average > 50 µg/m ³ each year
Particulate matter (PM _{2.5})	25 µg/m ³	-
Sulphur dioxide (SO ₂)	-	No more than 35 cases of a 15-minute average > 266 µg/m ³ each year No more than 24 cases of an hourly mean > 350 µg/m ³ each year No more than 3 cases of a daily mean > 125 µg/m ³ each year
Ozone (O ₃)	-	No more than 10 cases of an 8hr mean > 100 µg/m ³ each year

What are µg/m³?

Air quality is measured in micrograms per cubic metre (µg/m³). This is a measure of the weight of a pollutant in a space of air.

There are a thousand micrograms (µg) in a gram, or a billion micrograms in a kilogram.

A cubic metre (m³) is a thousand liters of air.

One microgram per cubic (1µg/m³) meter of pollutant is a billionth of a kilogram in a thousand liters of air.

Air quality monitoring results

Air quality recorded this year

The results of our air quality monitoring during 2018 are outlined below. The results also show whether health-based air quality objectives apply at that location, and if they are met. It should be noted that monitoring locations 2 and 13 have been decommissioned due to redevelopment at Manchester Airport.

Results of nitrogen dioxide (NO₂) monitoring using diffusion tubes:

Monitoring location	Recorded annual average (µg/m ³)	Air quality objectives apply?	Air quality objectives met?
1. T2 Traffic Crossing	55	No	-
3. Stand 69	42.3	No	-
4. B1D	38.8	No	-
5. Stand 42	46.7	No	-
6. 05L Localiser	25.6	No	-
7. 05R Localiser	20.7	No	-
8. 05R Glidepath	14.2	No	-
9. Crash Gate 13	20.5	No	-
10. Styal Road	22.1	No	-
11. Outwood Lane	62.1	No	-
12. T1 Departures A	82.6	No	-
14. Daisy Bank Lane	24	Yes	Yes
15. Stand 212	49.6	No	-
16. Toronto Avenue	51.8	No	-
17. ATC Tower	27.5	No	-
18. Little West Gate	31.3	No	-
19. T3 Departures	50.8	No	-
20. Stand 56	41	No	-

Results of continuous air quality monitoring:

	Recorded annual average (µg/m ³)	Air quality objectives apply?	Short term objective exceedances	Air quality objectives met?
Nitrogen dioxide (NO ₂)	23.6	Yes	Hourly Means > 200 µg/m ³ = 0	Yes
Particulate matter (PM ₁₀)	14.4	Yes	Daily Means > 50 µg/m ³ = 0	Yes
Particulate matter (PM _{2.5})	8.1	Yes	N/A	Yes
Sulphur dioxide (SO ₂)	3	Yes	15min Means > 266 µg/m ³ = 0	Yes
Ozone (O ₃)	46.4		8hr Means > 100 µg/m ³ = 18	No

Long term air quality monitoring results

Previous years monitoring data can be downloaded from our website. Using this information, you can see how air quality has changed over time.

It also provides links to websites where you can see detailed results of continuous air quality monitoring in Manchester and the rest of the UK. Please be aware that these websites use different names to describe our monitoring sites: Styal Road (our monitoring site 10) is called 'Manchester South'; and, Daisy Bank Lane (our monitoring site 14) is called 'Manchester Sharston'.

Want to know more?

Our website (www.manchesterairport.co.uk/emissionsinfo) provides more information in a range of formats. These include information sheets, progress reports and useful internet links.

If you would like to talk to us you could:

- phone our Freephone number (08000 967 967);
- send an email to community.relations@manairport.co.uk; or
- come to an outreach session (details are on our website).