

Air Quality Monitoring at New Street

28th March 2017

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Introduction

Network Rail has been undertaking a research project with the University of Birmingham to carry out a comprehensive assessment of air quality at Birmingham New Street Station.

This update will explain the scope of the project, current status and proposed next steps.

New Street Station Overview

New Street Station has been redeveloped to enhance customer experience, including the way that passengers use the new concourse facilities.

The station is served by a mix of rolling stock, of which 694 train services (approximately 45%) per day is diesel powered.



New Street Station Overview

As part of the recent station redevelopment, Birmingham New Street Station has benefitted from a new ventilation system which reacts to local conditions on each platform.

The ventilation system monitors Carbon Dioxide (CO₂) levels and automatically activates fans dependent upon the sensor readings. The ventilation system has 98 impulse fans, controlled by 9 CO₂ sensors on each of the 12 platforms, situated at occupant level. They also work in conjunction with wind direction.

New Street Station Overview

The impulse fan system also allows for different train types as the extraction points are not fixed as they were with the old system. This has helped during the redevelopment works as the station has had to operate with a reduced number of platforms to allow building work to take place away from passengers, so the platforms in use have seen a wider variety of rolling stock.



New Street Monitoring Project

With the station redevelopment nearly completed and with increasing public and media interest in air quality issues, it was seen as an opportune moment to undertake an air quality investigation at New Street.

Over the last five years Network Rail has had a Strategic Partnership with the University of Birmingham. Their experience with environmental measures and building aerodynamics has considerably benefitted this project.

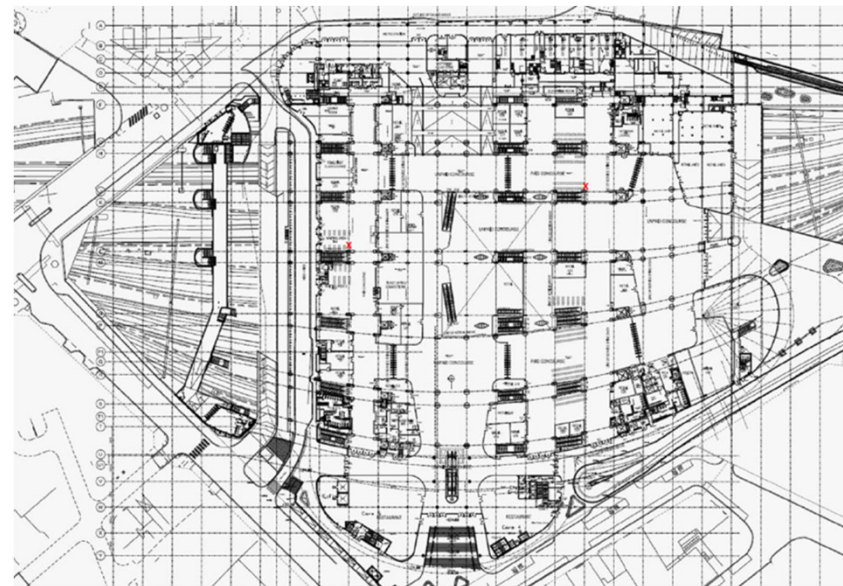
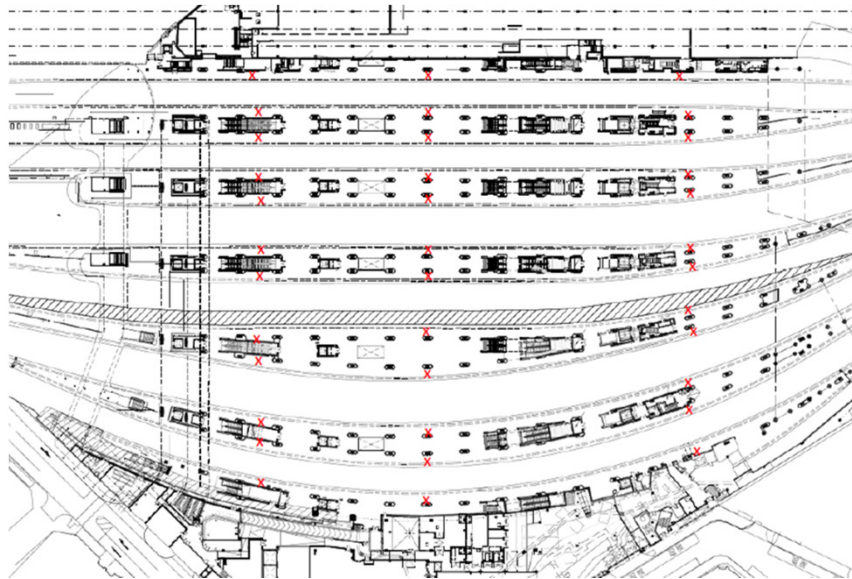


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Instrumentation and measuring periods

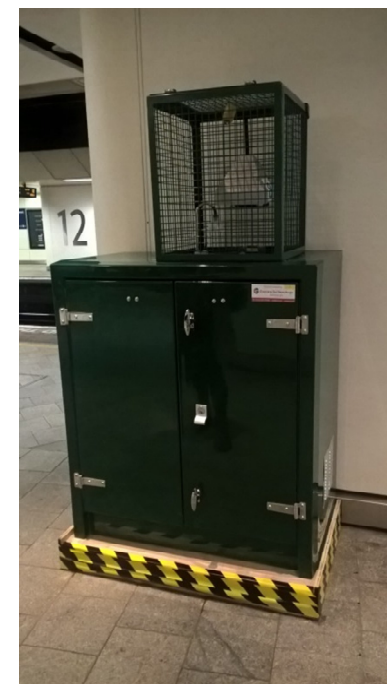
Diffusion tube measurements of average NO₂ concentrations across station – platforms and concourse.

Measurements taken from 18/10/16 to 15/11/16.



Instrumentation and measuring periods

Measurements of NO₂ (NO_x analyser and AQ Mesh), PM (DustTrak) and CO₂ (CO₂ analyser) on Platforms 10/11. Equipment located in the middle and at the A and B ends from 16/11/16 to 23/1/17.



Instrumentation and measuring periods

Mobile site continuous measurements made for one week periods on the B end of other platforms and on concourse, this includes measurements of NO₂ (AQ Mesh) and PM (DustTrak).



Instrumentation and measuring periods

Personal monitoring for Black Carbon and PM_{2.5} made with NR staff for one week - January 2017.



Instrumentation and measuring periods

Background city emissions, train operations and weather data was also captured.

Overall there are around 5 million data points captured each day.

No data analysis was carried out during this period as full attention was given to keep the monitoring equipment up and running!

Data Analysis and Outputs

The data is currently being checked and processed, with corrections for calibration and missing data etc.

The data will then be analysed and a report produced by the University of Birmingham over the next few months.

The report will be used to inform Network Rail on the performance of the systems in place in the station.

Conclusion

The monitoring undertaken by the University of Birmingham and Network Rail at New Street Station is one of the most comprehensive air quality projects carried out in the UK rail industry.

The information obtained from this work will help Network Rail get the best from the systems in place at New Street and enable discussion with train operators to be based on measured evidence.

There are plans to extend this work to consider train operation and other station types as part of a wider whole industry approach.



Thank you.

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