NARBOROUGH AIR QUALITY REVIEW 2024

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Overview

Air Pollution

Local Air Quality management investigates and monitors two main air pollutants: Nitrogen dioxide and Particulate Matter. Nitrogen Dioxide known as NO_2, is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation. The National Air Quality Objectives set out by Defra (the department for environment, food, and rural affairs) require annual mean concentrations of NO_2 to be under 40µg/m^3. Particulate Matter (PM) is everything in the air that is not a gas. Particles can come from natural sources, as well as human made sources such as dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres, $PM_{2.5}$ refers to particles under 2.5 micrometres, and PM_1 refers to particles under 1 micrometre. The national Air Quality Objectives set by DEFRA in 2023 state that by the year 2040, the annual mean concentration targets for Particulate Matter size 2.5 should not exceed 10µg/m^3.

How air pollution is measured

Blaby District Council have made an ongoing commitment to continue the monitoring and management of air quality. The council has five Air Quality Monitoring Stations and 27 diffusion tubes which measure Nitrogen Dioxide across the district. In 2022 and 2023 the council installed several mobile ambient air quality monitors (known as Zephyrs®), in the district which record real time data for NO_2 and Particulate Matter. The images below show examples of the monitoring equipment the council uses: An Air Quality Monitoring Station, A Diffusion Tube and a Zephyr®.

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Introduction

Local Air Quality management involves reviewing air quality within the Blaby district to highlight any areas that may require further investigation. During April to July 2024, the Council have undertaken an air quality review in the Parish of Narborough. Narborough is a busy village which sees a lot of traffic pass through. In addition, it hosts a trainline with a level crossing which causes the traffic to build up and queue at regular intervals throughout the day. The Council have monitored two of the busiest areas within the village, the area around the level crossing and the junction of Station Road and Leicester Road. Monitoring has focused on school run and rush hour times .

Observations

Vehicles

Monitoring was completed to determine both quantity and mode of transport using the area around Station Road, Coventry Road, and Leicester Road. Times observed were 7am-9am and 3-6pm over several different days. The photograph below shows an example of the queuing traffic at the junction of Station Road, Coventry Road and Leicester Road.

Cars were by far the biggest user of the roads in Narborough accounting for 82% of the traffic. Vans were the next highest user accounting for 14% of the vehicles. Other types, such as buses, bikes and heavy goods vehicles accounted for the remaining 4%.

It was observed that in the mornings there was an hourly average of approximately 605 vehicles between 7am and 9am. In the evenings there was an hourly average of 593 vehicles during the 3-hour period of 3pm and 6pm. Traffic was busier coming from the direction of Littlethorpe into Narborough in the mornings and from Narborough towards Littlethorpe in the afternoon/ evening. Traffic was reduced at all other times during the day.

Pedestrians

The morning pedestrian commute was observed to be spread out over a two-hour period. The busiest time for pedestrians in the morning was between the hours of 7am and 9am. This included adults on the work commute, older children going to college or secondary school and younger children accompanied by adults taking them to school. The Council also looked at the afternoon pedestrian figures and noted the most active times were spread out over a longer period of 3 hours, between 3pm and 6pm. Figures recorded between 7am-9am and 3pm-6pm ranged from 91 pedestrians an hour, up to 199 on some days, but only within these busy periods. An average of 52.5% being adults, 28.7% older children and 18.8% being children. The daily weather type had the biggest impact on figures, for example more people would drive their children to school on a wet day.

Trains

There is a Train station on Station Road in the centre of Narborough which impacts traffic and causes queues. National Rail have confirmed the barriers come down on a typical day on 93 occasions for an average period of 3 minutes and 15 seconds. It was observed that the barriers were down from 15 to 20 minutes in an hour period. This did vary depending on trains running late and barriers being kept down to allow for more than 1 train to pass. The longest single period observed of the barriers being down was for 11 minutes and this included a passenger train stopping at the station followed by a freight train.

Air Quality Monitoring

The council monitored 3 separate locations within Narborough, this included the Station car park, outside the train crossing on Station Road and at the junction of Station Road and Leicester Road. This was done using a Zephyr® device and was used to monitor levels of Particulate matter and Nitrogen Dioxide. The highest results were recorded at the junction of Station Road and Leicester Road.

The photograph below shows the Zephyr® device located at the junction of Station Road and Leicester Road.

Monitoring results

The table below shows the results of the Zephyr® located at the junction of Station Road and Leicester Road. It shows the average daily readings for both Nitrogen Dioxide and Particulate Matter. The national objectives set by DEFRA are for annual mean levels to be under 40µg/m^3.The highest average daily reading for NO_2 was 21.21µg/m^3, with a weekly average of 18.44µg/m^3, both of which are well below the national objectives.

DEFRA have set a future target for Particulate Matter 2.5 not to exceed annual mean concentrations of 10µg/m^3 by the year 2040. The levels recorded by the Narborough Zephyr showed a weekly average of 3.92µg/m^3 and the highest daily average at 4.95, all below the future target levels.

The chart below shows the average 24-hour readings from Station Road and Leicester road. The measurements are shown in µg/m^3.

	N02	PM1	PM2.5	PM10
2nd July 2024	18.8	2.7	4.95	6.36
3rd July 2023	21.21	2.5	3.77	5.99
4th July 2024	11.02	1.15	3.68	4.76
5th July 2024	20.42	1.75	3.29	5.29
6th July 2024	20.21	1.94	3.97	5.06
7th July 2024	16.36	1.48	3.2	4.54
8th July 2024	18.13	2.27	3.97	5.59
9th July 2024	21.4	3.03	4.6	13.33

The Council also examined the figures at the busiest times of the day and as expected the figures were higher. The highest hourly reading recorded at rush hour (8am-9am) was 35.93µg/m^3, which was still below the national objectives and only remained at this level for a short period.

Conclusions

Narborough is used as a commuter route mainly for trains, cars, vans, and pedestrians. The Train station provides an alternative way for people to travel, but in itself causes issues due to the trains crossing the main route through Narborough, which leads to queuing traffic several times throughout the day. However, it is pleasing to see that the monitoring has indicated that both Nitrogen Dioxide and Particulate Matter levels are all under the DEFRA nationally set objectives.

The council is committed to the ongoing monitoring of air quality within the district and have installed a diffusion tube at the junction of Station Road and Leicester Road. This will monitor Nitrogen Dioxide levels at the busiest area in Narborough and will remain in place for several months.