



Pollution Assessment Project: DRAFT REPORT

In the summer of 2018, the Board invited Professor Stephen Peckham, Director of the University of Kent Centre for Health Services Studies (CHSS), to give a presentation on road traffic pollution and to advise how the Society might carry out a survey to measure current pollution levels in Faversham. The presentation took place on 31 July, and the Board subsequently agreed a budget to support the project. After a site meeting and preliminary survey on 5 September, the Centre's Technical Manager Dr Ashley Mills drafted a plan that was put into action by our volunteers using equipment loaned by the CHSS. An article describing the proposal in non-technical terms appeared in the Society's Newsletter in January 2019.

Work carried out

The survey was designed to supplement and extend the data collected routinely by Swale Borough Council. The Council has an automatic counter permanently installed on Ospringe Street that monitors larger carbon particulates (PM10) and nitrogen dioxide (NO₂) gas pollution, together with a number of diffusion tubes that measure NO₂ pollution over an extended length of the A2. Our survey included measurements of smaller carbon particles (PM2.5) that hadn't previously been studied in this area, and it also included measurements of nitrogen dioxide pollution at sites around the Town's road network where until now, to our knowledge, no measurements have yet been made.

The work was divided into three separate strands:

1. Measurement of carbon particulates on the A2 at Ospringe Street and in Water Lane, which involved continuous surveillance by our volunteer team during the morning and afternoon peak periods on weekdays over the period 17 – 28 September. Readings were taken using four *Dylos DC 700* electronic monitors (two PM2.5 units and two PM10 units) stationed about 300 mm above footway level.
2. Measurement of nitrogen dioxide concentrations at seven sites around the Town using disposable 'diffusion tubes' mounted at a height of about 2.5 metres above footway level (mostly on lampposts), over a continuous period of nine months from September 2018. The tubes were removed at the end of each month and sent to a laboratory for analysis.
3. A roving *Zephyr* back-pack unit with GPS and digital radio that uploaded continuous NO₂ readings to the CHSS computer during a series of walking trips made at random around the streets of the Town, totalling around ten hours over a two-week period in September 2018.

Data analysis

Since diffusion tube measurements are prone to bias, a key factor in the survey plan was to ensure that the readings were compatible with those routinely collected by the Borough Council. All the diffusion tubes were analysed by an independent, nationally recognised laboratory, and the results were calibrated against Borough data. This was done by adjusting our Ospringe Street readings to match those obtained from the Borough's own results at the same location (actually thirty feet away), and the readings at all the other sites in our survey were adjusted by the same ratio. In the CHSS report attached, the authors experimented with other adjustment factors to see whether this made an appreciable difference to the results, but in my opinion, the most accurate results are those obtained with the 'locally derived bias adjustment factor' as mentioned

above, but ‘annualised’ to give an estimate for the calendar year 2018 so they can be compared directly with the data for other sites on the Borough road network (Borough Council data is published annually on the internet, and the latest year for which results are available is 2018).

Results of our survey

Detailed survey data are set out in the attached report from CHSS, and in condensed form at the end of this document. Here, I will summarise the key results, starting with the carbon particulate measurements at Ospringe Street and Water Lane. Essentially, when averaged over the observation period, the PM_{2.5} and PM₁₀ levels were below the limits currently recognised in the UK, but above the limits recommended by the World Health Organisation. In addition, the continuous readout gave our study team an opportunity to see how the levels varied over time with traffic conditions. Occasionally we observed peaks that seemed to coincide with individual vehicles, and our impression was that most of the offenders were light vans and private cars rather than heavy lorries, except for a small group of skip lorries attached to one particular company. We also observed peaks when heavy trucks accelerated after slowing down near the Water Lane junction, and surprisingly perhaps, high levels were observed during a lull in traffic when heavy vehicles were travelling *faster* than usual for this site.

The nitrogen dioxide levels were recorded at Ospringe Street, Water Lane, Ashford Road (next to the fire station on the northbound approach of the A251 to its junction with the A2), East Street (near to the signal junction with Crescent Road), Crescent Road (near to the same junction), West Street (near the junction with South Road), and Preston Street (outside the Assembly Rooms). The average levels recorded at Ospringe Street, Ashford Road, East Street, and Crescent Road were well above the WHO limits and either close to or above the UK limits.

The backpack results were analysed separately and the results appear in the form of a map as detailed in the CHSS report. Overall, we now have a reasonably clear impression of traffic pollution across the Town and it seems unlikely that there are any hotspots that we don’t yet know about.

I should stress that the pollution levels we have measured in Faversham are not as high as the ones that occur in major cities such as London, Birmingham and Glasgow, but they do provide evidence in support of two new Air Quality Management Areas (AQMAs): (a) on the Ashford Road approach to the A2 and (b) in the area around the signal junction between East Street and Crescent Road. There is already an AQMA at Ospringe Street. Residents living in all three areas are being exposed to levels of exhaust pollution that represent a significant health hazard. There is also a risk to children on their way to and from Ospringe Primary school and the Abbey School. Although they are exposed for relatively short periods, the health implications are not fully understood. Recent research has revealed links between traffic pollution and reduced lung growth, asthma, and even in extreme cases, cognitive function. Tellingly, the UK government recognises the need for more decisive action especially as regards carbon particulates, and its policy is to

‘...progressively cut public exposure to particulate matter pollution as suggested by the World Health Organisation. We will halve the population living in areas with concentrations of fine particulate matter above WHO guideline levels (10 µg/m³) by 2025’.

A national tightening of the regulations could be important for Faversham, which will need protection over the next decade or so as a consequence of the housing developments currently taking place around the outskirts of the Town, which are likely to generate vehicular traffic queues on the relatively sparse and narrow streets that make up the Town’s distributor road network.

Survey team

We are grateful to Professor Stephen Peckham and Dr Ashley Mills for their help with this study, and the author wishes personally to thank the eleven volunteer members of the survey team whose dedicated efforts made it possible:

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16 September 2019*

Appendix: Key results

Table 1: Carbon particulates at the Ospringe Street and Water Lane sites

<i>Site</i>	<i>PM2.5</i>	<i>PM10</i>
<i>OSPRINGE STREET</i>	10.8	22.0
<i>WATER LANE</i>	10.4	22.3
<i>Recommended UK limit</i>	25	40
<i>Recommended WHO limit</i>	10	20

Table 2: Nitrogen dioxide levels at the seven sites around the Town, locally derived bias adjustment factor, annualised to 2018

<i>Site</i>	<i>Code</i>	<i>Nitrogen Dioxide level</i>
<i>OSPRINGE STREET</i>	FAV_1	38.1
<i>WATER LANE</i>	FAV_2	20.6
<i>ASHFORD ROAD</i>	FAV_3	41.7
<i>EAST STREET</i>	FAV_4	41.4
<i>CRESCENT ROAD</i>	FAV_5	37.1
<i>WEST STREET</i>	FAV_6	30.7
<i>PRESTON STREET</i>	FAV_7	29.6
<i>Recommended UK limit</i>		40
<i>Recommended WHO limit</i>		40