

Identifying Healthier Workshop Heating Solutions

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In partnership with



The Problem

Many workshop and garage spaces have to operate on a 'semi-outdoor' basis, meaning they often have to keep their doors open for practical or commercial reasons. Because of this they often have to use diesel based space heaters during the winter. These heaters create large amounts of NOX pollution which is detrimental to health.

The Need

There is evidence that air pollution can cause permanent lung damage in young children, and can exacerbate lung and heart disease in older people [2][3]. Particulate pollution alone costs society £16billion a year in health related costs, and 8.5% of deaths in Bristol are attributed to air pollution.[4]

The Goal

The goal is to find a way to keep garages warm without using fossil fuel, but while still respecting the practical & commercial needs of a car garage and its employees.

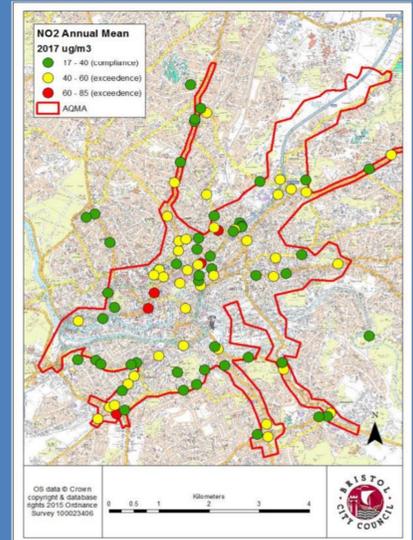


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Our Suggested Solutions

Short Term

Education, Culture and Awareness



Highlight the issues to garages, motivating them to make positive changes.

Clothing Choices



Wear clothes which mean less heating is needed. Potential for other benefits from clothing choices.

Door Usage



Keep the door closed or at least lowered as much as possible to reduce heat loss through convection.

Medium Term

Retrofit Insulation

Fit new insulation to the existing buildings to minimise heat loss.



Infrared Heaters

Utilise IR heaters to directly heat occupants not the space. No heat loss due to convection.



Fast Acting Roller Door

Use modern door technology to allow the door only be open for a short time when required.



Long Term

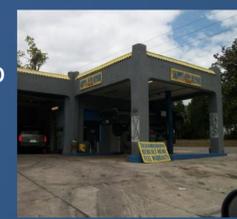
Heated Clothing

Heat the occupants directly with actively heated clothing, negating the need for space heating solutions.



Building Design

Improve new build design standards to minimise the need for dirty heating solutions.



Road Map for the Future

Implementation of the Suggested Solutions

Publicising & disseminating the results of the deliverable in a way that has an immediate, practical impact.

Detailed Analysis of the Problem & Solutions

How bad are the current heaters? How much heat is "lost" due to the door, the building design, the insulation etc. How do the suggested solutions improve this?

Case Study

Monitor a garage's heating usage, heating bills, temperature & air quality. Compare against regulations and targets then suggest or implement alternative solutions. Compare with the original set up

What Went Well

- The planning and preparation.
- Site visits & face-to-face meetings.
- Wide range of solutions.

What Could Be Improved

- Time-management during busy times of the year
- Did not utilise our engineering knowledge.
- No validation of solutions.

References

1. Bristol City Council Air quality Annual status report 2018
2. Royal College of Paediatrics and Child Health, Every breath we take – The lifelong impact of air pollution, February 2016 (URL: <https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-li-felong-impact-air-pollution>)
3. Simoni et al., Adverse effects of outdoor pollution in the elderly, Journal of Thoracic Disease, January 2015 (URL: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4311079/>)
4. Air Quality Consultants, Health Impacts of Air Pollution in Bristol, February 2017