





Report Summary

BUTLER'S WHARF & DARTFORD PIER VESSEL MONITORING

MARCH 2022





About the Project

River freight provides an opportunity to develop the currently under-utilised River Thames as a major transport artery. However, slower implementation of emission standards on inland vessels alongside a long inservice lifetime of the inland waterways fleet suggests the potential for high real-world pollution.

This trial installed monitors at 3 sites, at Dartford Pier and Butler's Wharf, as well as on the Equity, a diesel vessel delivering on the Thames. Through this, air and noise pollution could be attributed to specific practices and vessels, thus helping to understand the pollution impact of moving freight on the River Thames.









Key Findings 1: Emissions compared to Defra & new WHO standards



Figure 1: No of compliance pollution breaches at each monitoring station and by UK (Defra) and International Standard (WHO)

- Figure 1 shows that there were many instances of WHO breaches, especially for NO₂. As for a standard to aim for, EMSOL recommend somewhere between the WHO guidelines, which are very stringent and Defra, which are too lenient.
- As Figure 2 shows, there was excess NO₂ during peak periods (06.00 - 08.00) due to boats cold starting and excess idling. The report shows that the vessel contributed to this.
- There are also troughs in the data (00.00 05.00), which could give scope for a night service to minimise the pollution spikes.
- The report recommends using ambient thresholds as markers for monitoring pollution. The ambient threshold changes between the weekday and the weekend. During the weekend, the background levels of pollution are much lower, especially in the City and will show how much difference river freight operations make.
- Real-time pollution monitoring and transparency of data, alongside education on how to reduce pollution through lower speeds and operational changes can drive behaviour change.



Key Findings 2: Pollution caused by river freight activity

- PM10 pollution was highest at Butler's Wharf followed by Dartford Pier.
- Hotspots were also identified at bends in the river as a result of pollution being unable to disperse and boats going slower in these areas and therefore being there for longer.
- Pollution is also higher when the boat travels at 18mph+, which is possible between Tower Bridge - Dartford.



- The pollution impact from the vessel was notable at both piers, especially Butler's Wharf as the sensor was closer to the pier. The report concludes that this must be as a result of river freight based activity, as the hotspots don't appear on nearby London Air Quality Network (LAQN) sensors.
- As river freight scales up in future, this is likely to worsen without control measures. For recommendations on how to mitigate this, see <u>page 6</u>.





Key Findings 3: Site specific pollution comparison

- Average air pollution was consistently higher at Dartford Pier than Butler's Wharf.
- This was particularly pronounced between 06.00 08.00, when the boat cold starts from Dartford Pier.
- There are also external factors contributing to the higher levels, such as a bend in the river reducing pollution dispersion.
- EMSOL note that the baseline levels of pollution vary between the weekday and weekend, the latter of which is much lower. These ambient levels could be used as a baseline for future pollution monitoring.

4: Noise pollution caused by river freight

• The noise created by the boat is negligible, meaning that there is scope for a night service without affecting riverside communities. This will help mitigate against the spikes identified in 'Key Finding #3' at peak hours.





Key Recommendations

Further Projects

- Looking at alternative fuel types and their pollution impacts, such as hydrotreated vegetable oil (HVO) or hydrogen
- To see optimum operating speeds
- Measure interventions and mitigations

Alternative Schedules

- Out of hours or weekend deliveries
- Deliveries schedules in other identified pollution troughs



Operator Training

- Education on importance and impact of emissions reductions
- Using real time data to see why and when there are higher levels of pollution and drive competition between operators



Standard and Regulation Setting

- Using ambient thresholds to measure pollution
- Enforcement, reporting and transparency of emission levels
- Ensure parity with new road regulations



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Change in Operating Procedure

• Change loading and operating procedures to reduce idling time and cold starts



Vessel Focused Pollution Mitigation

- Air pollution dispersion technology at hotspots
- Engine emissions outlet extraction and filtration during cold starts





You can read the complete "Butler's Wharf and Dartford Pier Vessel Monitoring Report", which was produced as part of Cross River Partnership's Defra-funded Clean Air Villages 4 programme, <u>HERE</u>

Other Cross River Partnership (CRP) resources:

- <u>Clean Air Logistics for London (CALL)</u>: Project Page
- <u>Getting Started with River Freight</u>: A Guide for Businesses
- <u>Light Freight:</u> Design Solutions for Thames Freight Infrastructure
- <u>CRP Connect 4 Session 4</u>: Sustainable Cities: Reinventing the River
- <u>CRP Lunchtime Launch 8</u>: The Future of Sustainable Shipping and Trade in London

If you would like further information about CRP or anything that has been included in this report, please get in touch:



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