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Centre for Environment & Health

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# Working with the construction industry

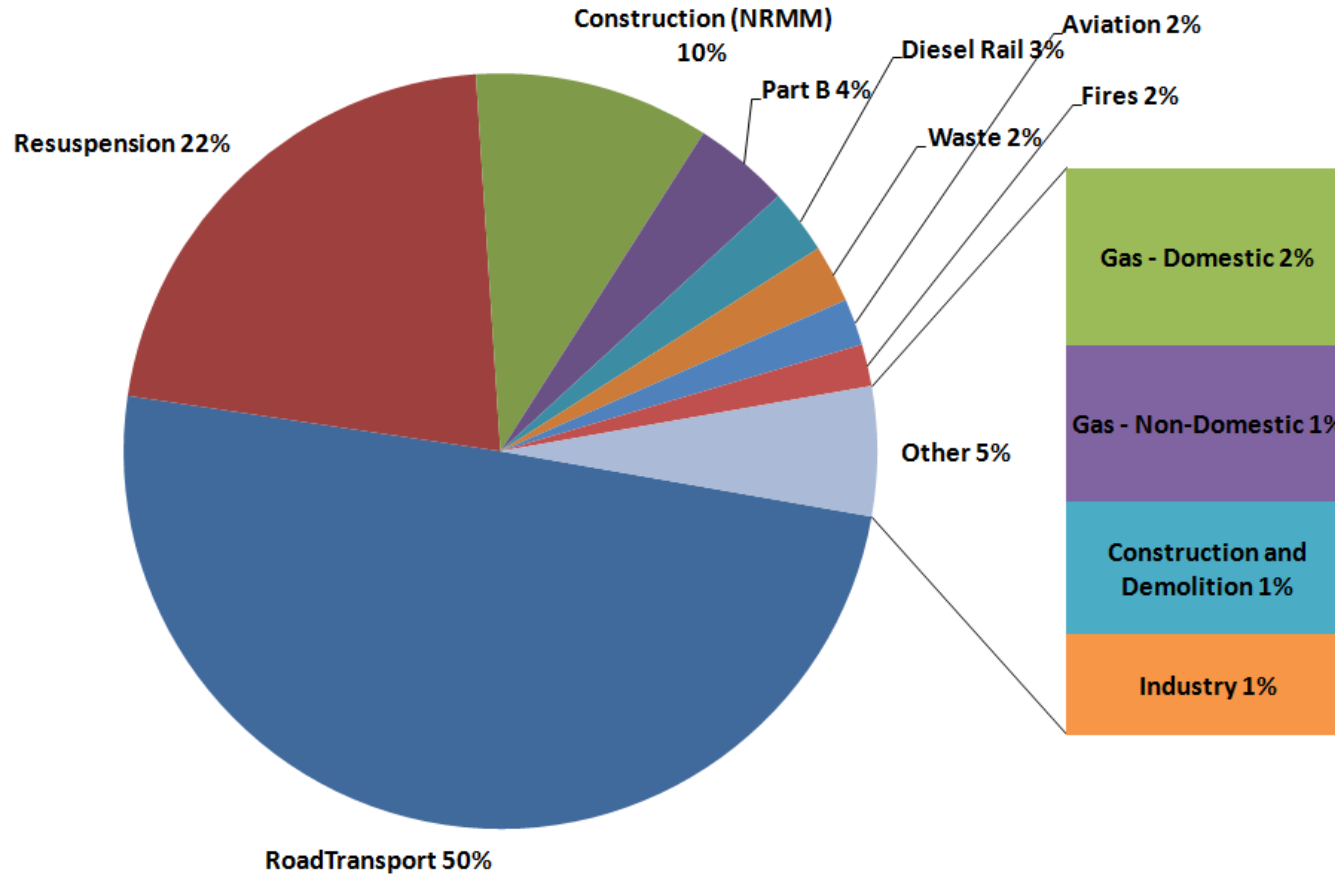
Daniel Marsh – King's College London

2<sup>nd</sup> July 2015



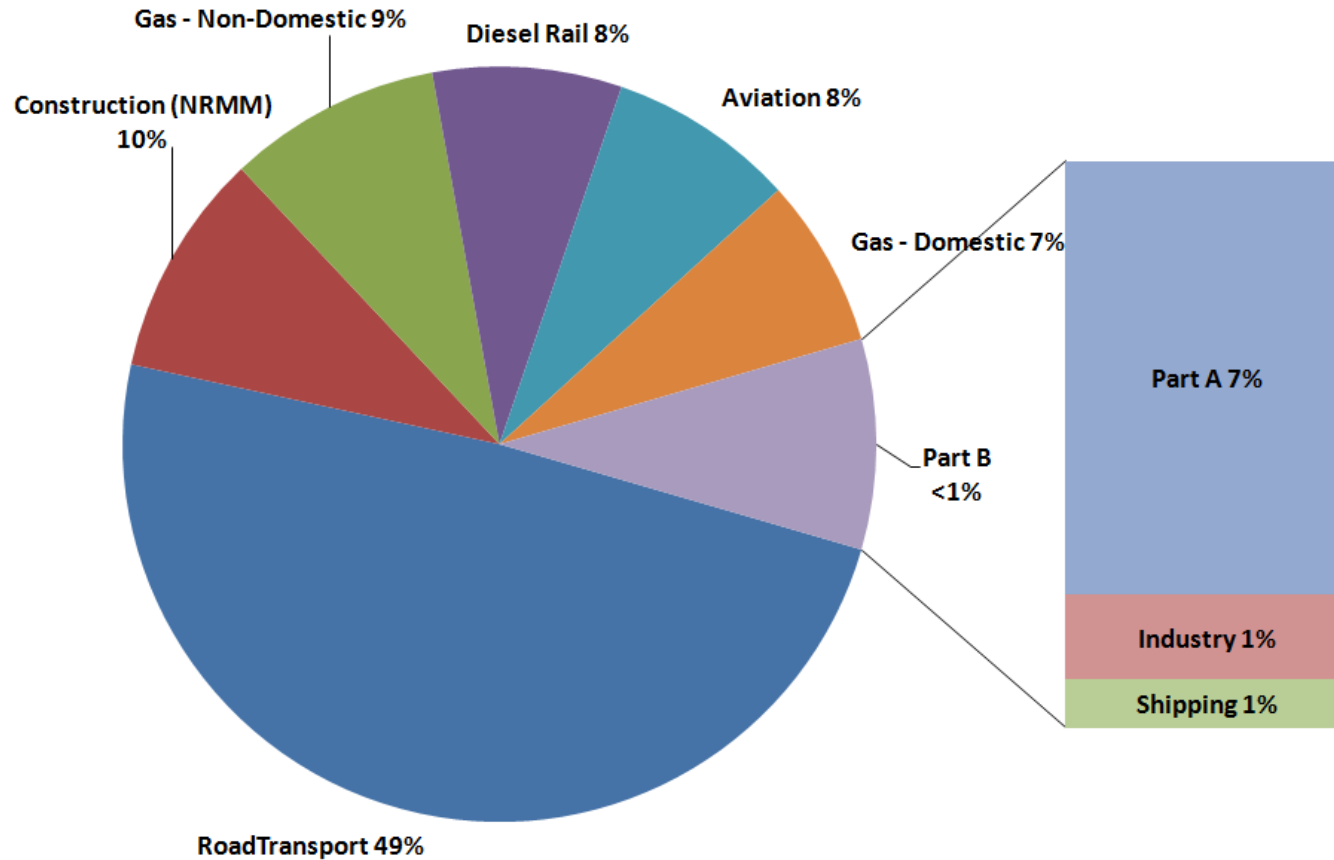
**WHY TARGET THE CONSTRUCTION  
INDUSTRY?**

# LAEI PM<sub>10</sub> emissions (t/annum) 2010



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# LAEI NO<sub>x</sub> emissions (t/annum) 2010



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# Sources and health impacts of construction generated pollution

- The main pollutants being generated are particulate matter (PM) and nitrogen dioxide (NO<sub>2</sub>)
- The main sources are from onsite machinery and generators (termed 'non-road mobile machinery' - NRMM) as well as dust generated from activities such as demolition and earthworks
- Material tracked out onto the public highway can be re-suspended and remain in the air for many hours or even days



# LONDON LOW EMISSION CONSTRUCTION PARTNERSHIP

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**TRANSPORT  
FOR LONDON**



Supported by



**ISLINGTON**



# Project Objectives

- Raise awareness across the construction industry of its impact on local air quality.
- Encourage the uptake of 'best in class' pollution reduction (abatement) measures.
- Improve pollution monitoring and make this data available for construction sites in London.
- Help to fund 'best in class' abatement measures at construction sites.
- Evaluate the cost benefit of pollution abatement techniques.

# LLECP Website

- A dedicated website containing information on the air pollution impacts from the construction industry and the available abatement measures.
- Demonstrate ‘best in class’ mitigation and abatement techniques
- Provide trial details and a real-time pollution measurement platform on the project website

[www.llecp.org.uk](http://www.llecp.org.uk)

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# Industry targeted LLECP Website

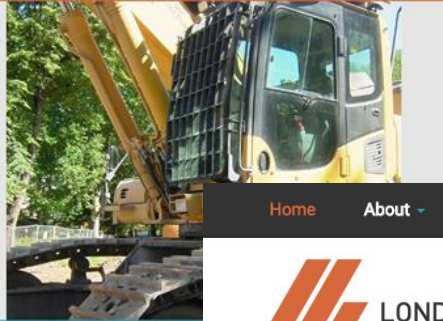


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## What is my legal requirement?

From September 2015 the London Mayor will introduce new standards to reduce pollution emissions from the construction industry with tighter standards proposed for the start of the London Ultra Low Emission Zone in 2020.

[Read more...](#)



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## Working together to build a cleaner London

### Are you a...

- Project manager
- Property developer
- Local resident
- Local authority officer

### How do I find out...

- Health advice
- Non Road Mobile Machinery

## London Low Emission Construction Partnership

The London Low Emission Construction Partnership (LLECP) is a collaboration between the 'Cleaner Air Boroughs' in central London and King's College London. The project is funded by the Greater London Authority (GLA) and aims to reduce emissions from the construction industry.

[Read more...](#)



### Air Pollution Forecast

Today

Moderate

[More information and health advice](#)

### Tweets

Construction Dust UK  
New #NRMM #emission s  
#London from Septembe  
#construction pic.twitter.c  
Show Photo

Construction Dust UK  
#Air #Pollution Linked To  
May Narrow The Arteries  
#construction #health

## Working together to build a cleaner London

### Are you a...

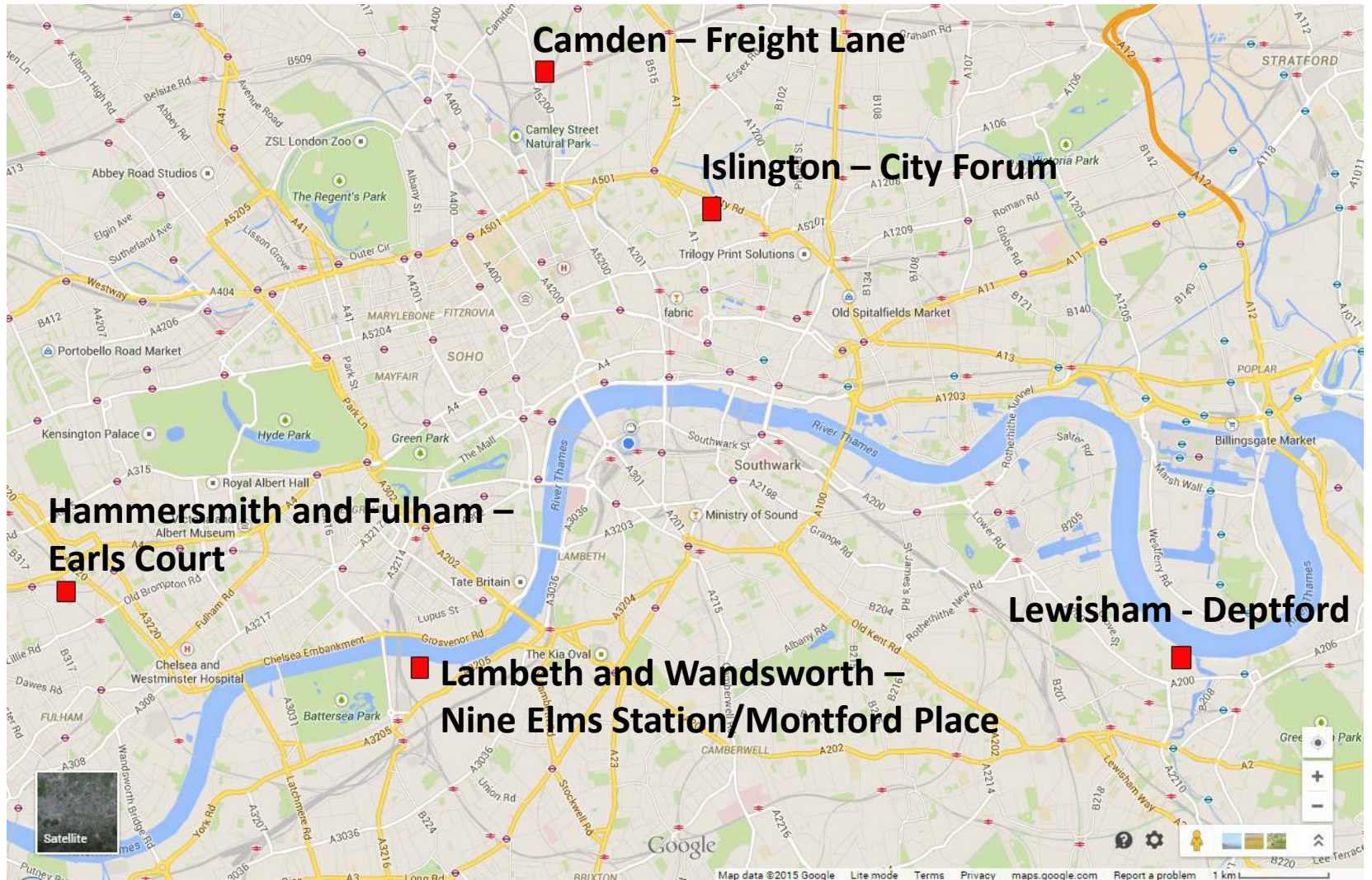
- Project manager
- Property developer
- Local resident
- Local authority officer

### How do I find out about...

- Health advice
- LLECP construction projects
- Non Road Mobile Machinery



# LLECP trial construction sites



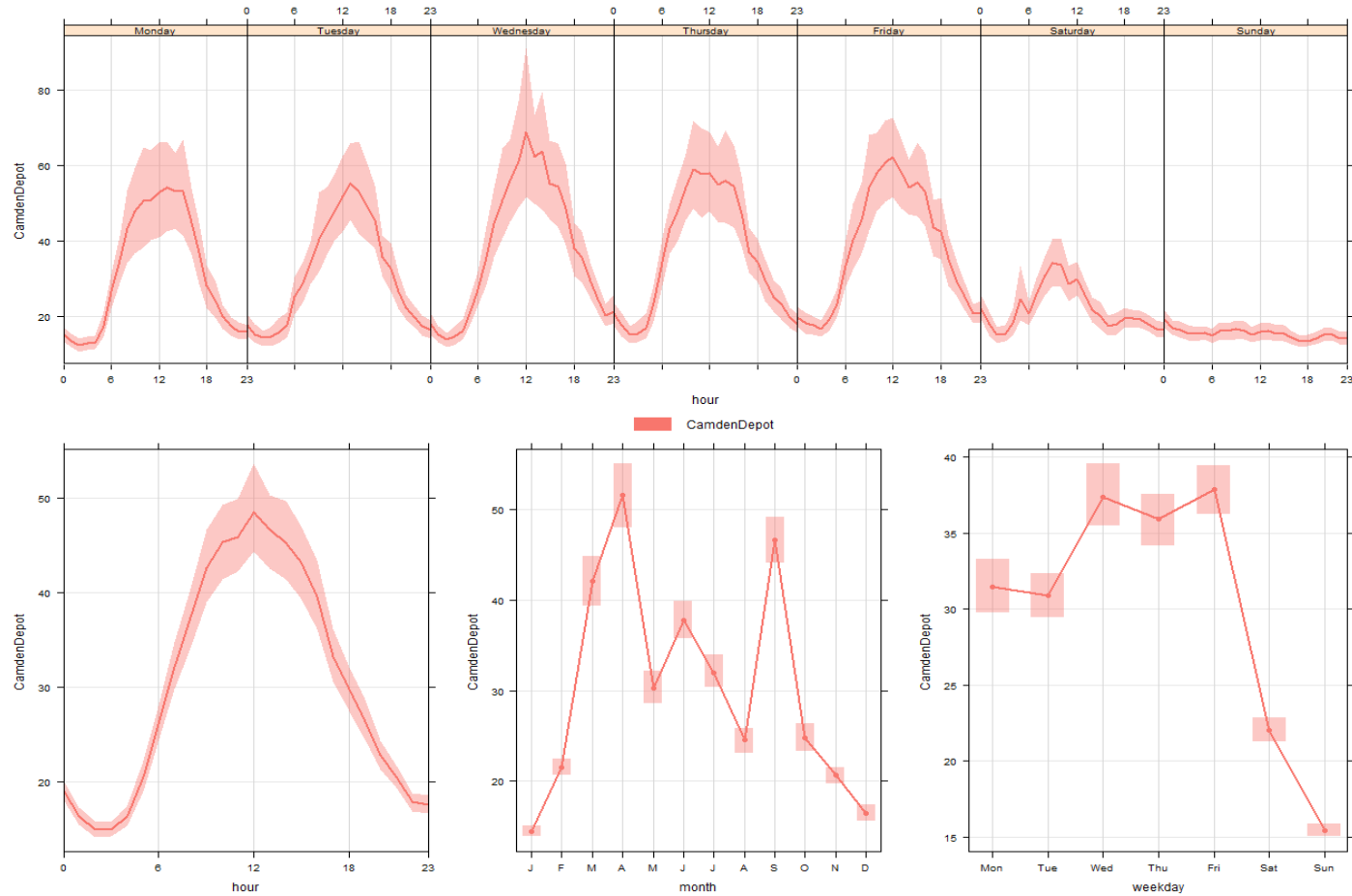
# Camden – Freight Lane



Use of Calcium Magnesium Acetate (CMA) chemical dust suppressant to reduce resuspension of particulate matter from trackout around cement batching sites in Camden

Phased CMA trial followed by 'back to black' street cleansing

# Freight Lane PM<sub>10</sub> concentration profiles



# London Borough of Islington

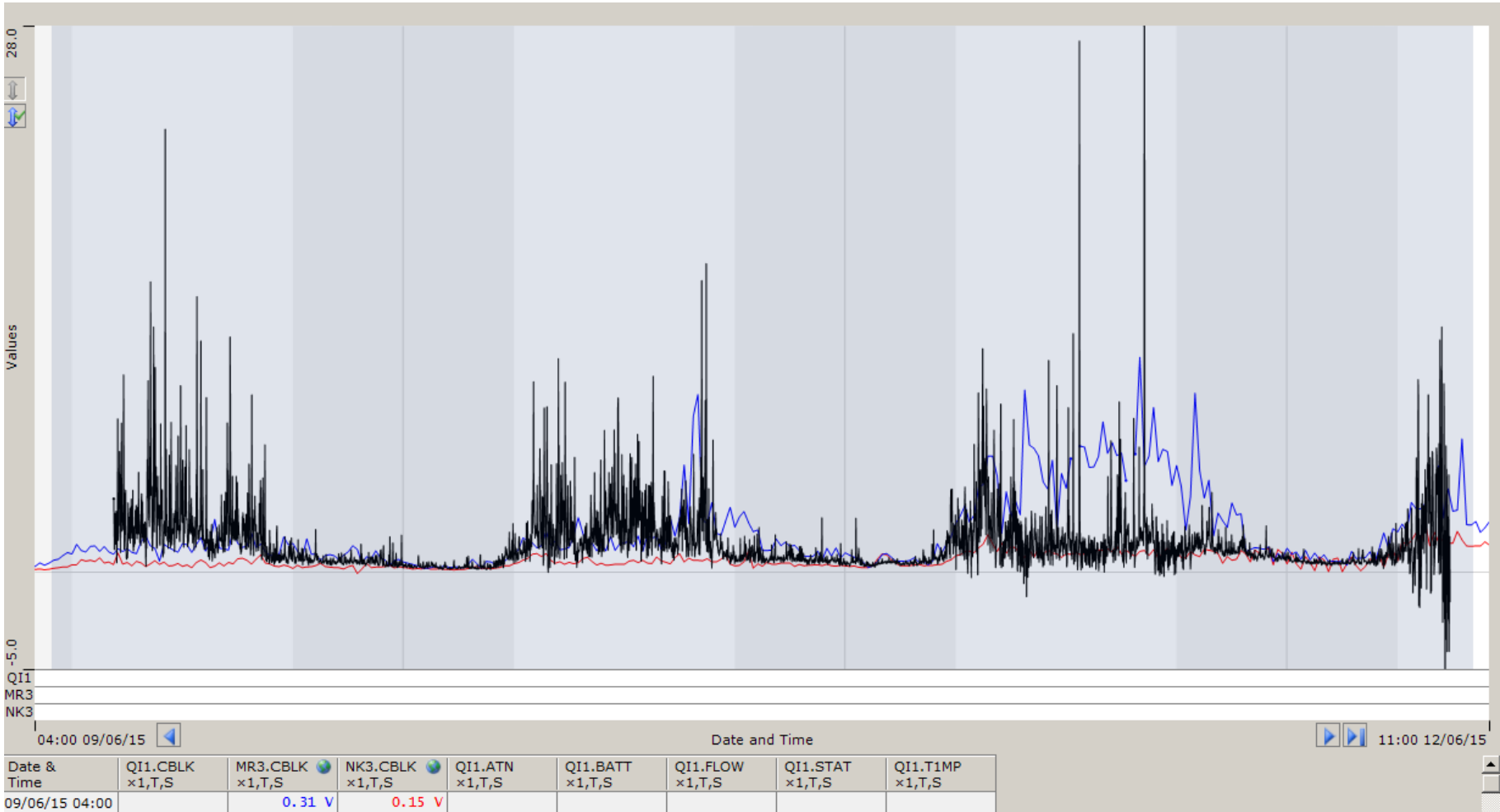


ULEZ 2015 compliant NRMM

Black carbon concentrations being recorded with a 'microAeth' personal exposure monitor attached to NRMM in Islington to measure the percentage reduction attainable through use of a cerium oxide based nano particle diesel fuel additive (DPF assist)



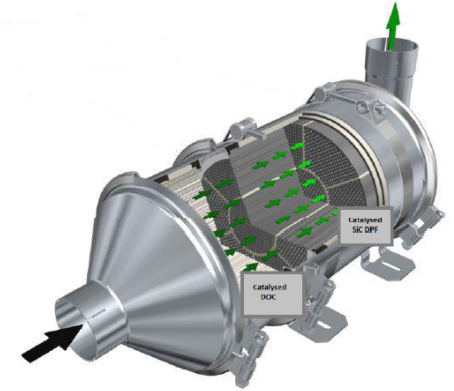
# BC concentrations from baseline monitoring week 1





**EARLS COURT DEMOLITION –  
BLACK CARBON REDUCTION TRIALS**

# GENERATORS



Intelligent power solutions and retrofit technology to reduce particulate matter, black carbon and CO2 emissions as well as reducing fuel costs at Nine Elms Northern Line Extension





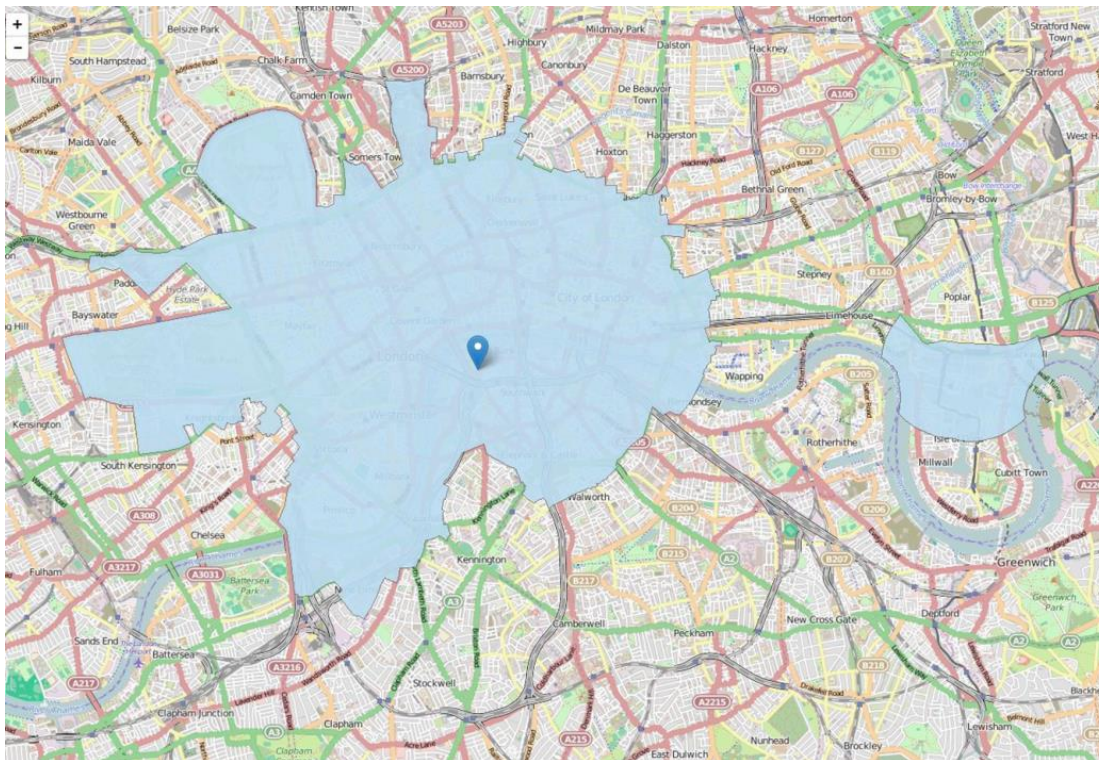
**CLEANER MACHINERY FOR LONDON:  
THE LOW EMISSION ZONE FOR NON-  
ROAD MOBILE MACHINERY**

# London's LEZ for NRMM

**1<sup>st</sup> September 2015**

NRMM used across the 'central activity zone' & Canary Wharf will be required to meet stage IIIB of the directive as a minimum

NRMM used on the site of any major development within Greater London will be required to meet stage IIIA of the directive as a minimum



**1<sup>st</sup> September 2020**

Tighter emission standards for CAZ, Canary Wharf and Greater London introduced

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# Non-road mobile machinery website

- Website to inform developers and contractors about which equipment will be compliant for use within the NRMM low emission zone
- Require registration of NRMM details from all major developments within the CAZ and Canary Wharf
- Allow for NRMM LEZ exemption application
- It will allow for local authority remote enforcement of GLA policy

- It will create a unique data resource that will add to the understanding of what NRMM equipment is currently being used and allow later assessment to demonstrate the uptake of higher emission standards
- It will allow for a more accurate London Atmospheric Emission Inventory (LAEI) to be developed
- It will allow for GLA policy change updates

[nrmm.london](http://nrmm.london)

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## London's 'Low Emission Zone' for non-road mobile machinery



### NRMM Register



How to use the NRMM register



How to read engine plates



NRMM Exemption policy



Retrofit technology

Not sure what these are?

[How to use this site](#)

### Does this apply to me?

From 1 September 2015 NRMM of net power between 37kW and 560kW used in London will be required to meet standards.

This will apply to both variable and constant speed engines for both NOx and PM.

These standards will be based upon engine emissions standards set in EU Directive 97/68/EC.

Want to find out more?

[Read more...](#)

# Project outcomes (so far)

- Need a good communications strategy
  - Brand, website, social media
- Outreach
  - Important to work with local authorities
  - Partnership approach
  - Found good understanding and positive response for change
  - Concerned about personal exposure rather than the environment
- Measurements
  - Starting to produce data on effectiveness of ‘best in class’ measures
- Improvements
  - Need to work better with Local authority planning departments at early stage



llecp.org.uk

nrmm.london

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erg-construction@kcl.ac.uk