



Air Quality & Traffic Management



Air Quality - Widespread issue:  
 AQMAs and authorities exploring  
 CAZs/ LEZs

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## London case study

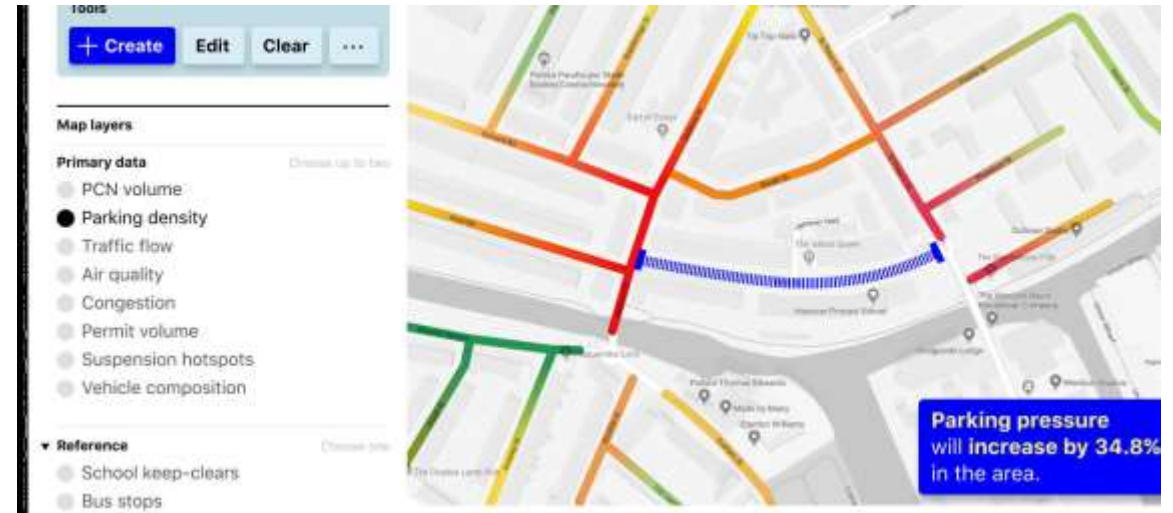
ANPR vehicle enforcement of moving traffic including

- Air quality sensors
- Noise sensors
- Traffic counts
- Speed counts

Using these cameras we have captured vehicle registrations with air quality data to create real time data assessing traffic schemes

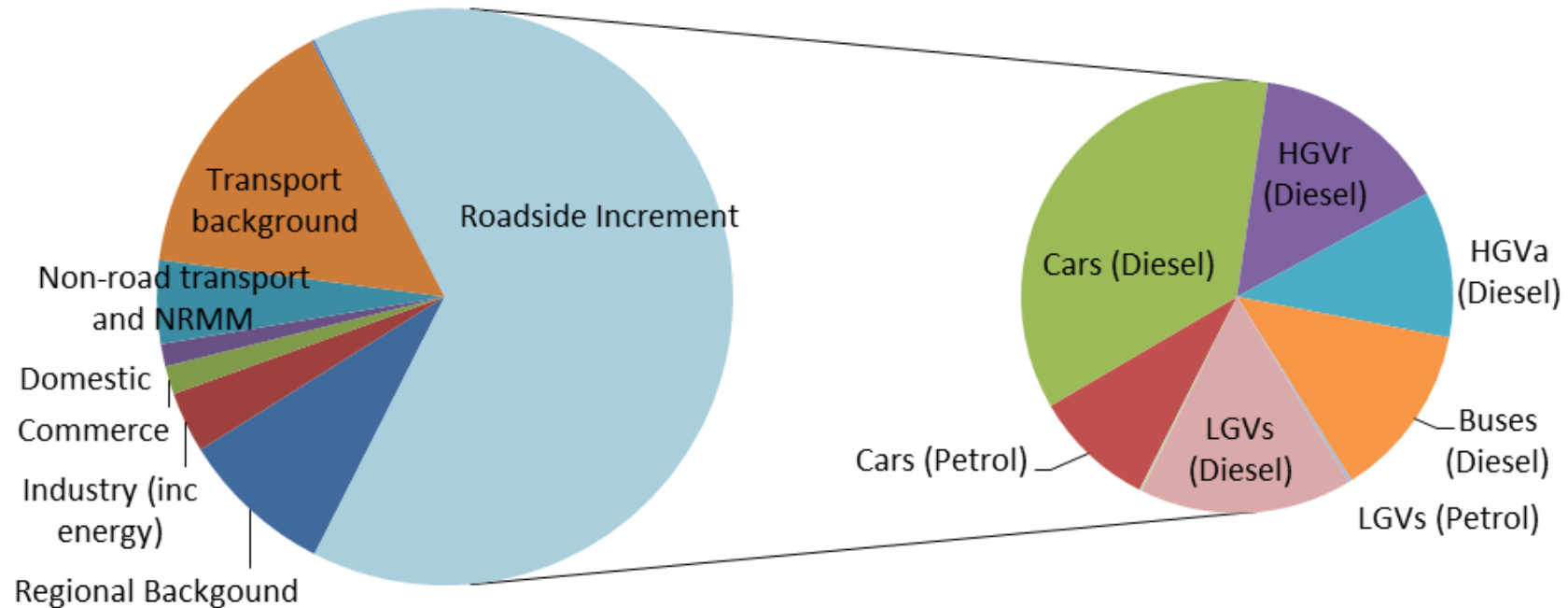
The cameras can assess the weight capacity of a vehicle and are being used for HGV enforcement of vehicles over 3.5 and 7.5T

# Using the data and ANPR cameras for real time traffic modelling



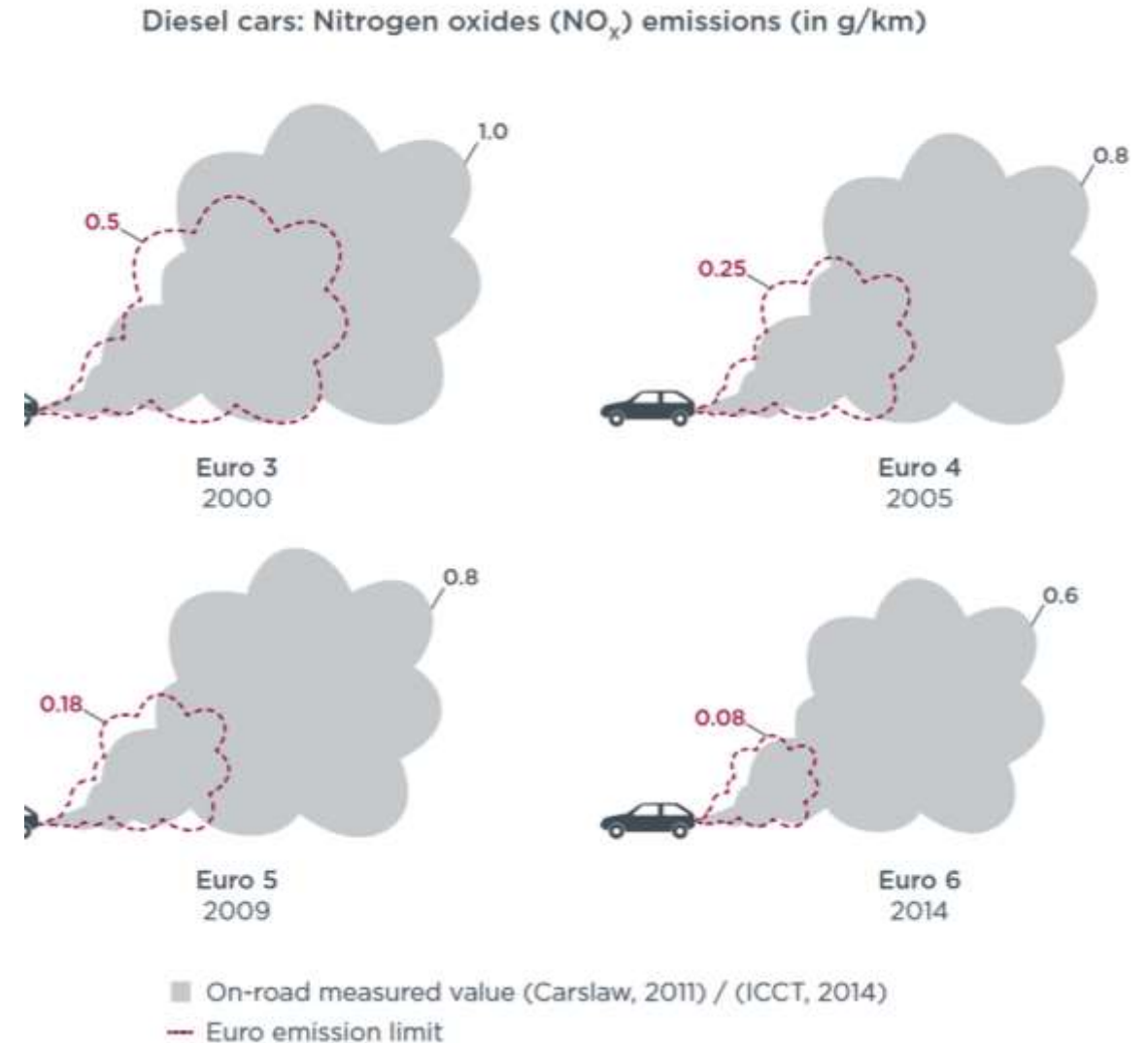
# Emission contributions in urban areas


- Road transport typically accounts for at least 40% of **NO<sub>x</sub> emissions** in urban areas
- However, emissions are released at ground level where they have maximum impact.
- Close to roads the contribution from road vehicles easily dominates concentrations and exposure – across the EU, road transport emissions account for 64% of **NO<sub>2</sub> concentrations**



# Real World v Lab-based type approval emissions

- Most AQ management strategies are based on lab-based emission factors ...
- ... Yet significant discrepancies between emissions detected in diesel vehicle exhaust during type-approval tests and those observed during “real-world” operation (ICCT)



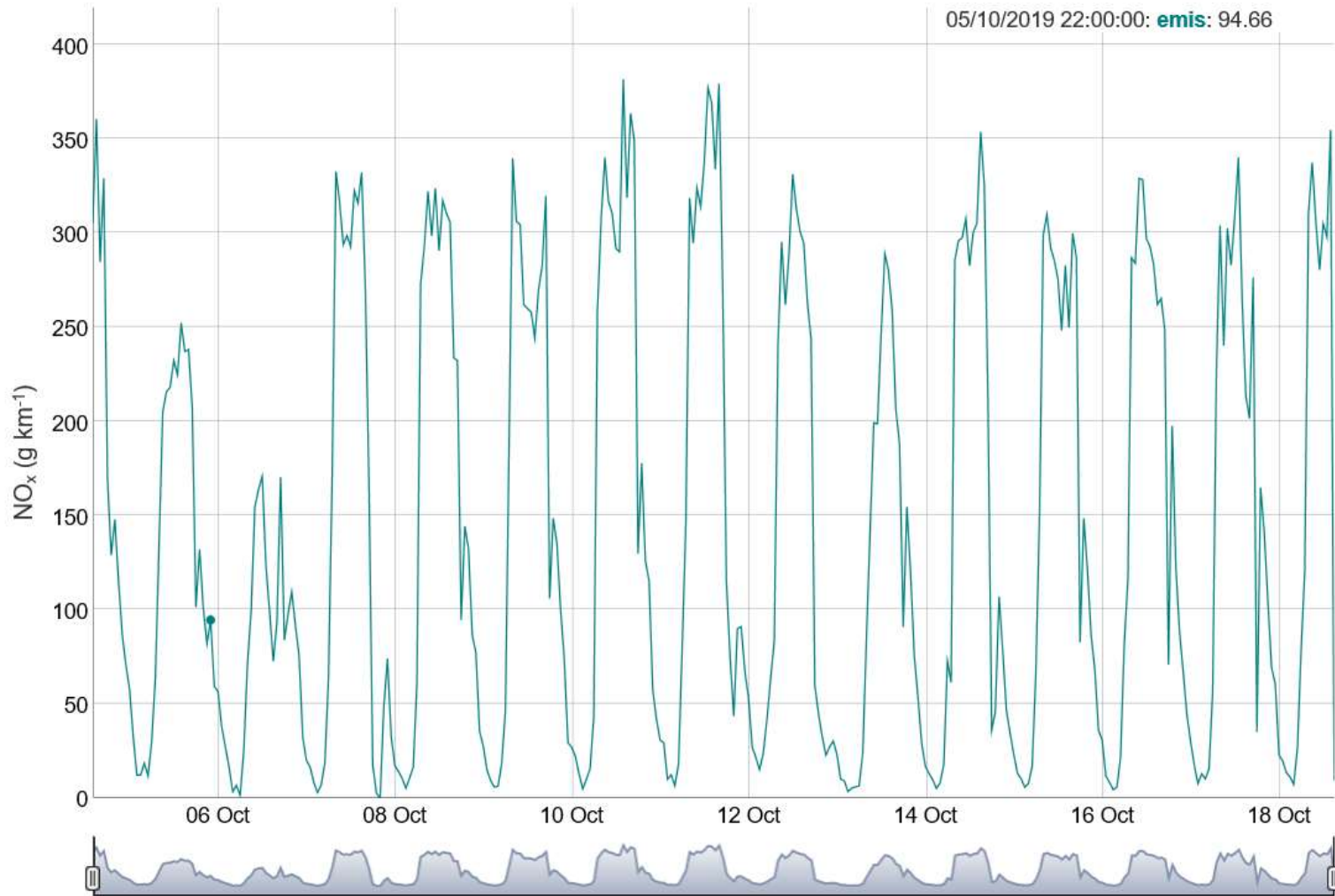


# Sample real ground level data

TES and Ricardo used ANPR and emissions sensors to collect data from a London Borough.

The data is calculated from remote sensing data of real world driving emissions using ANPR data.

Figure 1: NO<sub>x</sub> emissions per hour of day

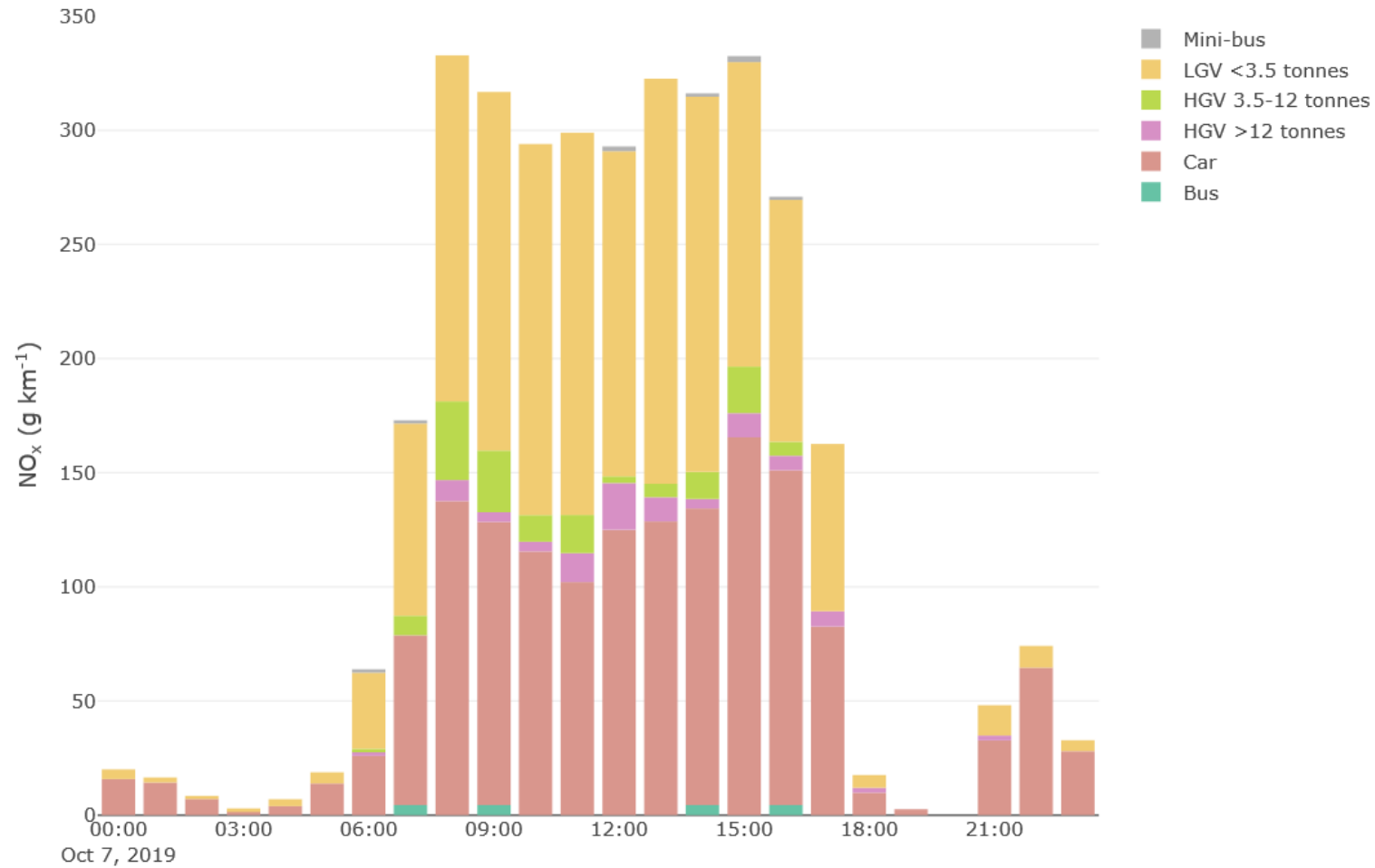


NO<sub>x</sub>  
emissions  
per hour of  
day



- Emissions start to increase around 6am and have decreased around 6pm

Figure 2: NO<sub>x</sub> emissions split by vehicle type and fuel type per hour of day

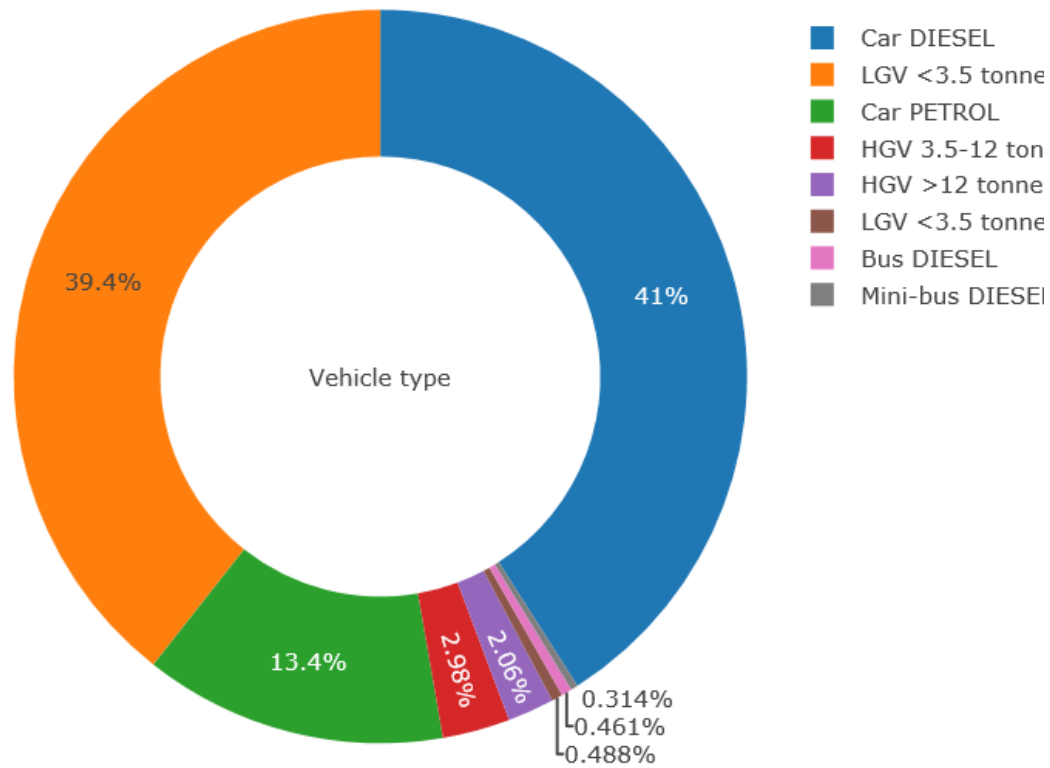


Emissions  
by Vehicle  
Type - NO<sub>x</sub>

# Source apportionment

## Emissions by vehicle type and fuel type

- Diesel cars and diesel LGVs contribute highest proportions of emissions with an approxi

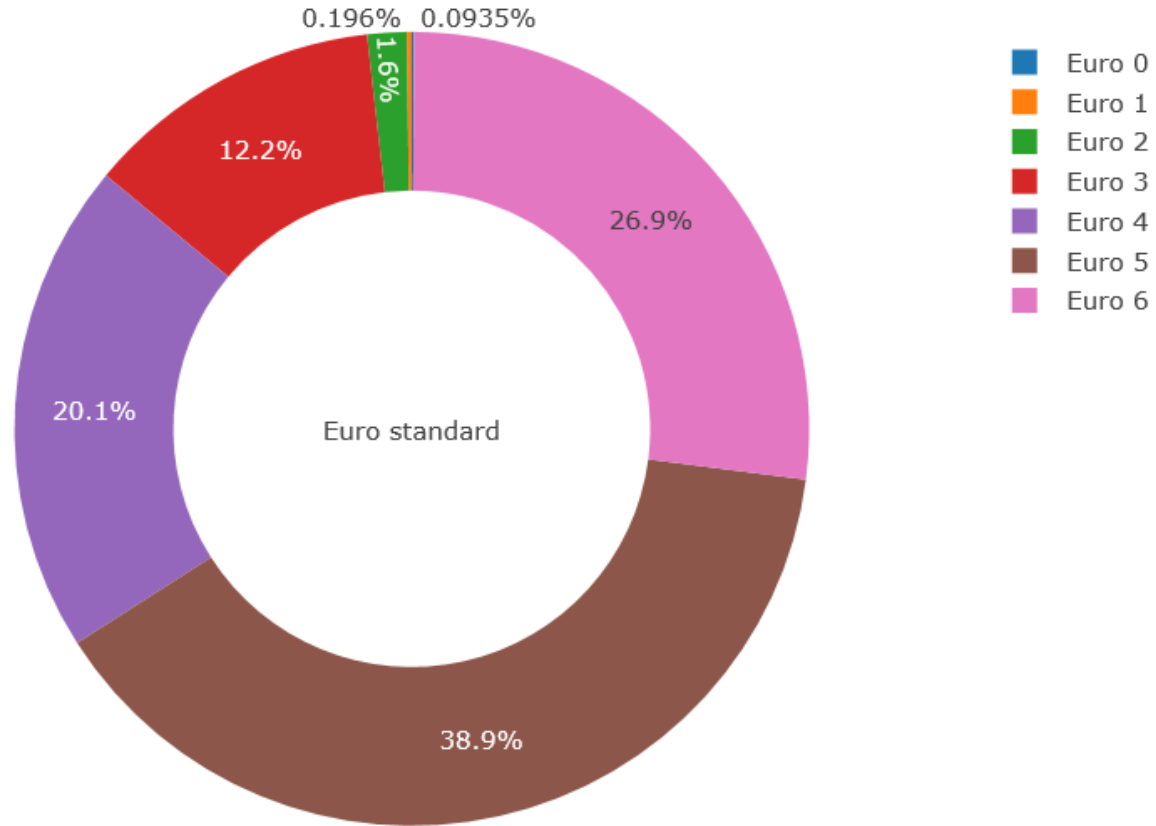


# Source Apportionment

Emissions per Euro standard

Number of vehicles per Euro standard

- Euro 5 vehicles contribute most to emissions



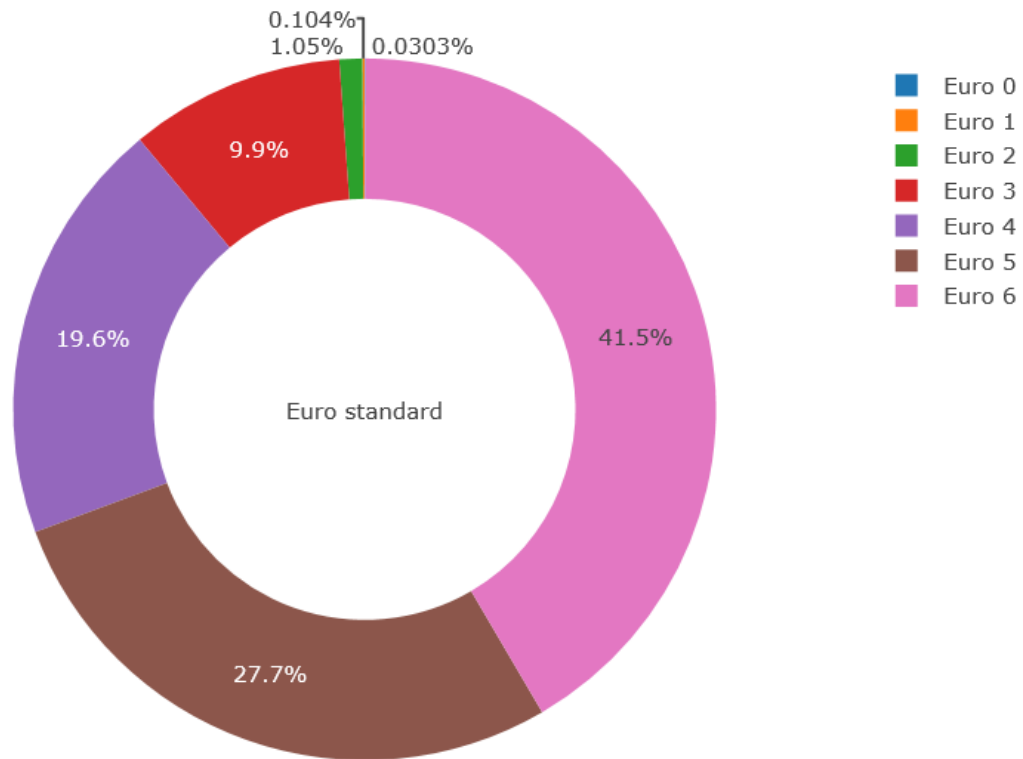
Emissions  
by Euro  
Standard

## Euro standards

Emissions per Euro standard

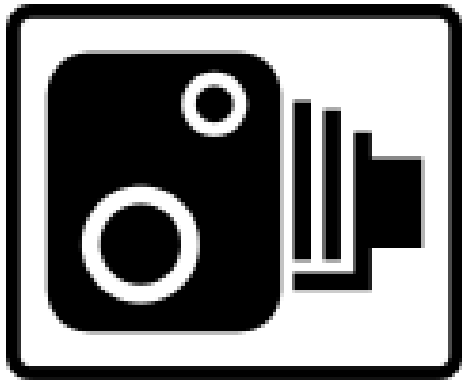
Number of vehicles per Euro standard

- Large proportion of vehicles are Euro 6 (41.5 %) but these vehicles contribute less to overall emissions (see emissions tab = 26.9 %)

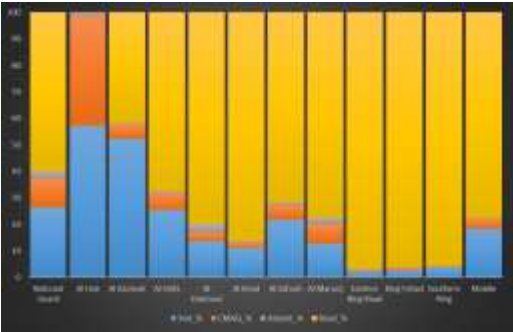
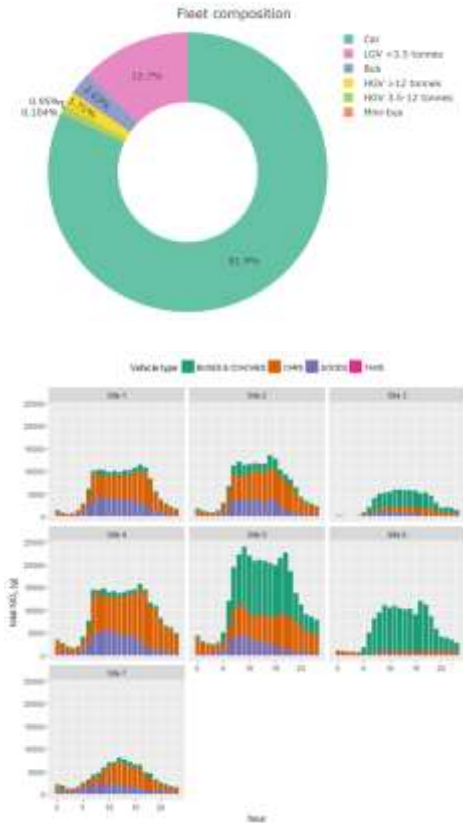


Number of  
vehicles by  
Euro  
Standard

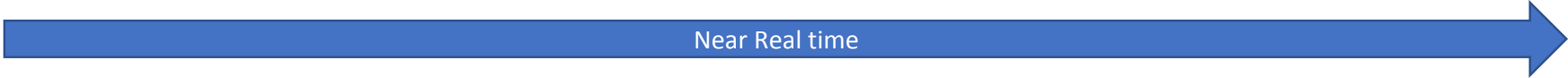
ANPR Data



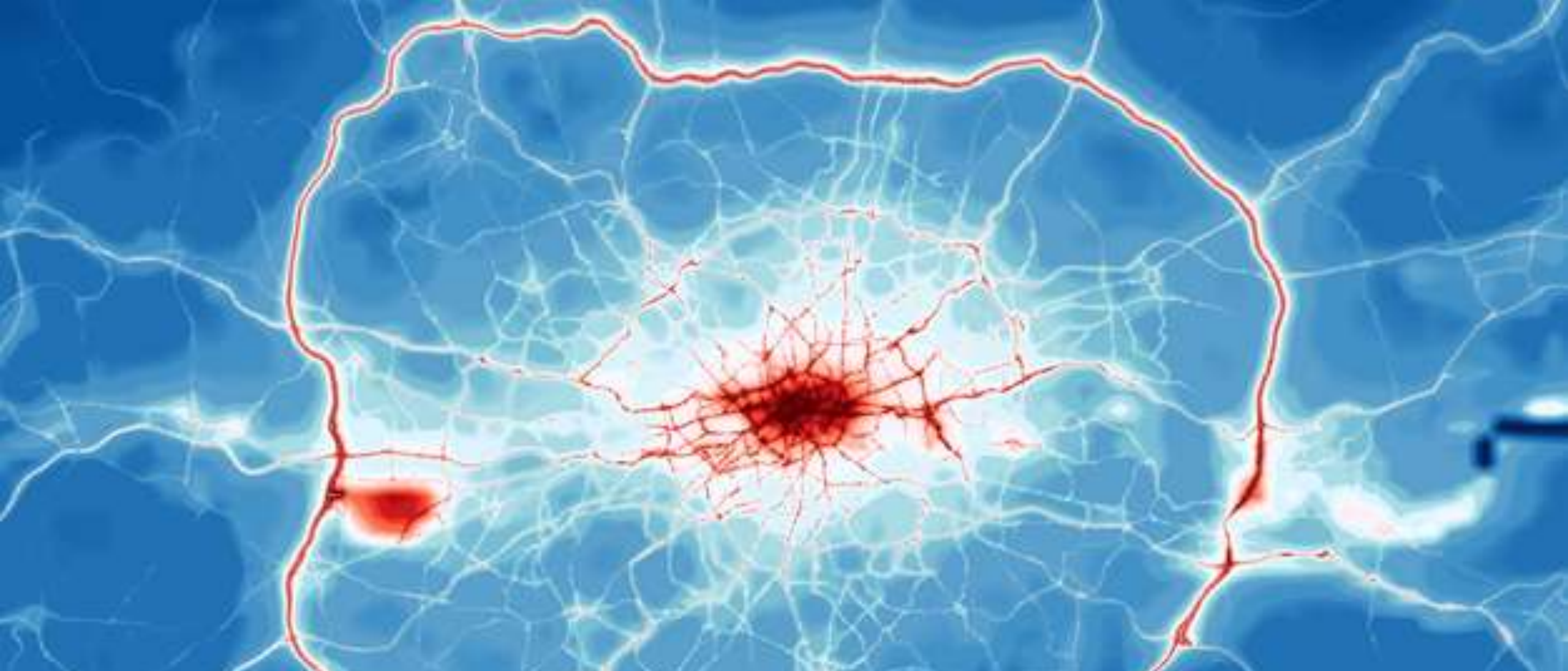
Ricardo Real World Emissions Database & Emissions Processor



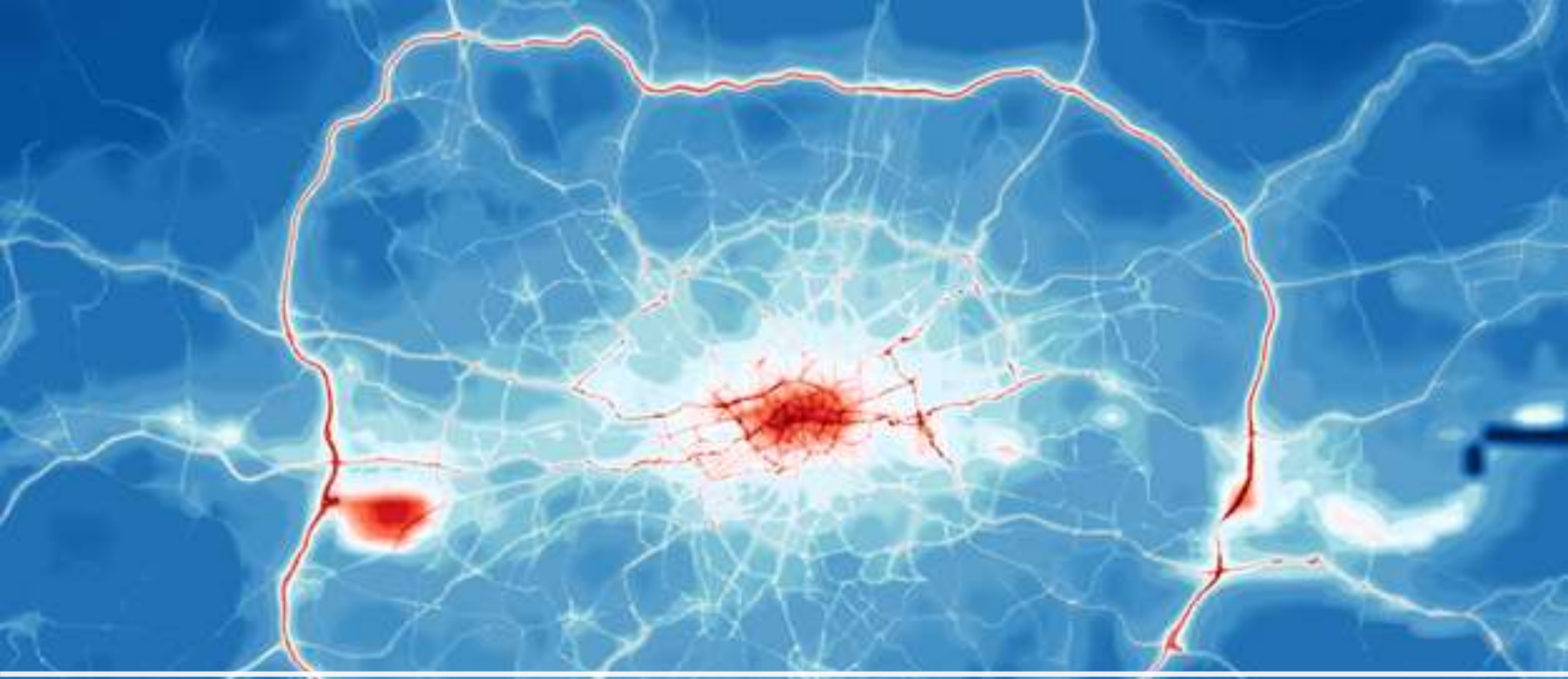
Better Policy making and tracking



Near Real time



Mapped Annual mean concentration of NO<sub>2</sub> in London (2018)



Mapped annual mean concentration of NO<sub>2</sub> if all vehicles Euro 6/ VI



Questions?

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