

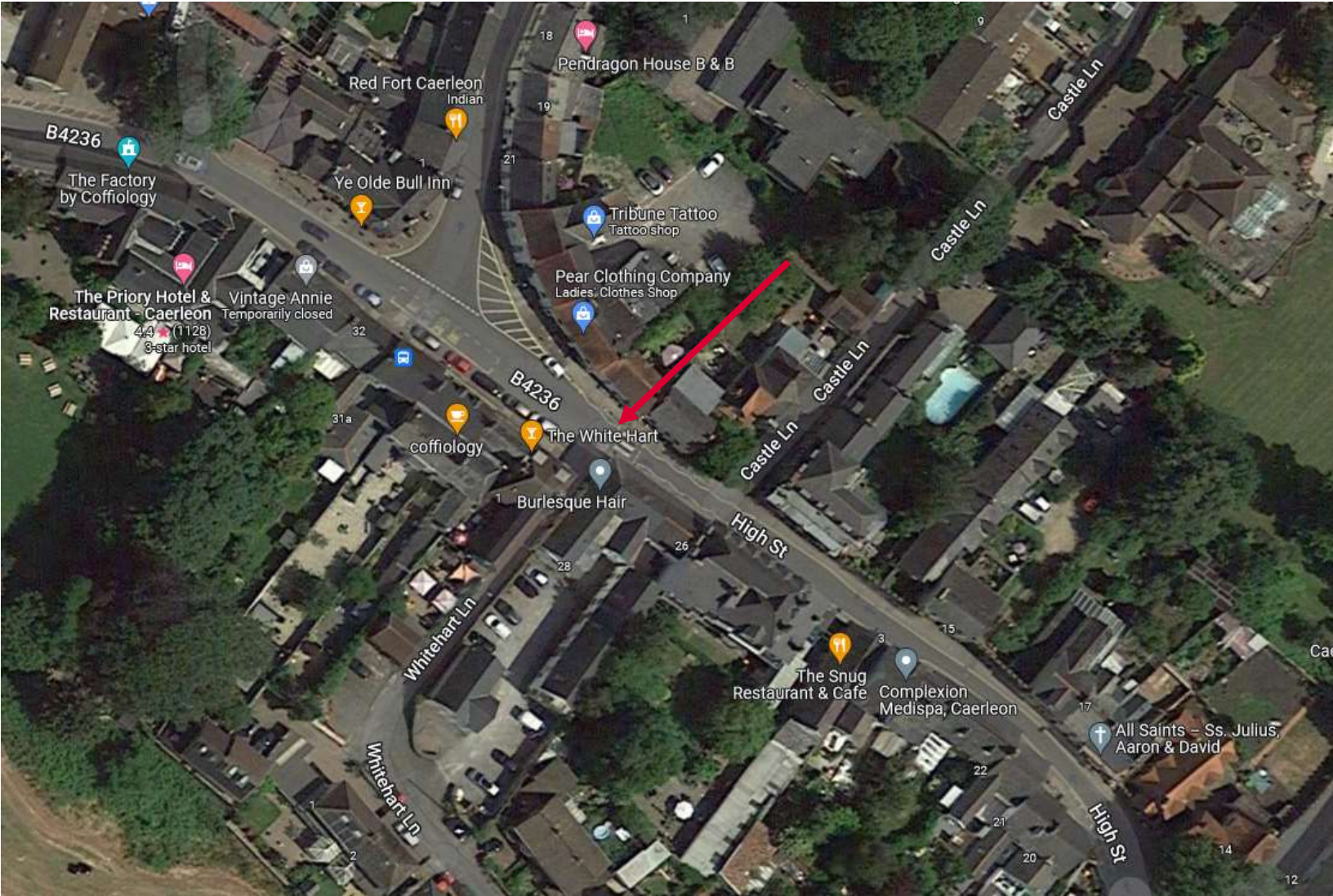


High Speed Air Quality Analysis and Vehicle Emission Compliance

Friday 9th of December, 2022

Dr. Mark Peckham
Jamie Parnell
Caed Knight

Measurement location



Measurement location



Measurement Setup



Analysers



- Independent measurement of NO and NO2
- T10-90% of **15ms**
- Sensitivity of **5 ppb – 5000 ppm**
- Portable (**17.2kg/ 45x37x13cm**)

**Also available: Total Hydrocarbons, CO2, Particulate Number*

Measurement method

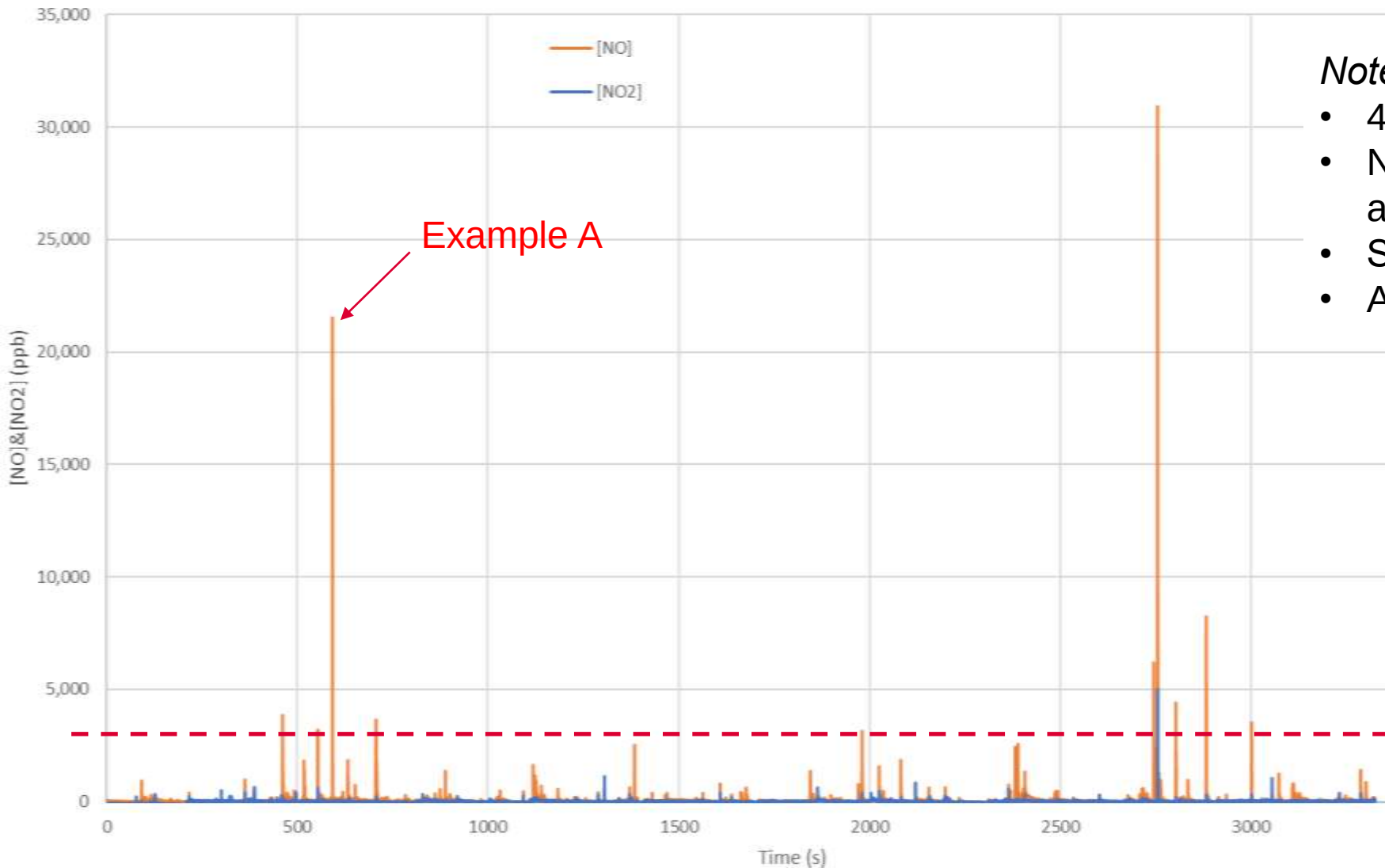


Available ANPR data (from DVLA vehicle enquiry API)

Time Stamp	Date	Plate Number	Confidence	Height (px)	Proc Time (ms)	Multiplate	Country	Roi ID	Error	registrationNumber	taxStatus	taxDueDate	artEndDate	motStatus	make
20	12/12/2022	KE21YSO	99	17	52	2	United Kingdom	1		KE21YSO	Taxed	01/07/2023	30/06/2027	No details held by DVLA	VOLVO

yearOfManufacture	engineCapacity	co2Emissions	fuelType	markedForExport	colour	typeApproval	euroStatus	dateOfLastV5Cissued	realDrivingEmissions	automatedVehicle	wheelplan	monthOfFirst Registration	motExpiryDate
2021	1969	167	ELECTRIC DIESEL	FALSE	GREY	M1	Euro 6d	22/11/2022	2	FALSE	2 AXLE RIGID BODY	2021-07	

Data overview

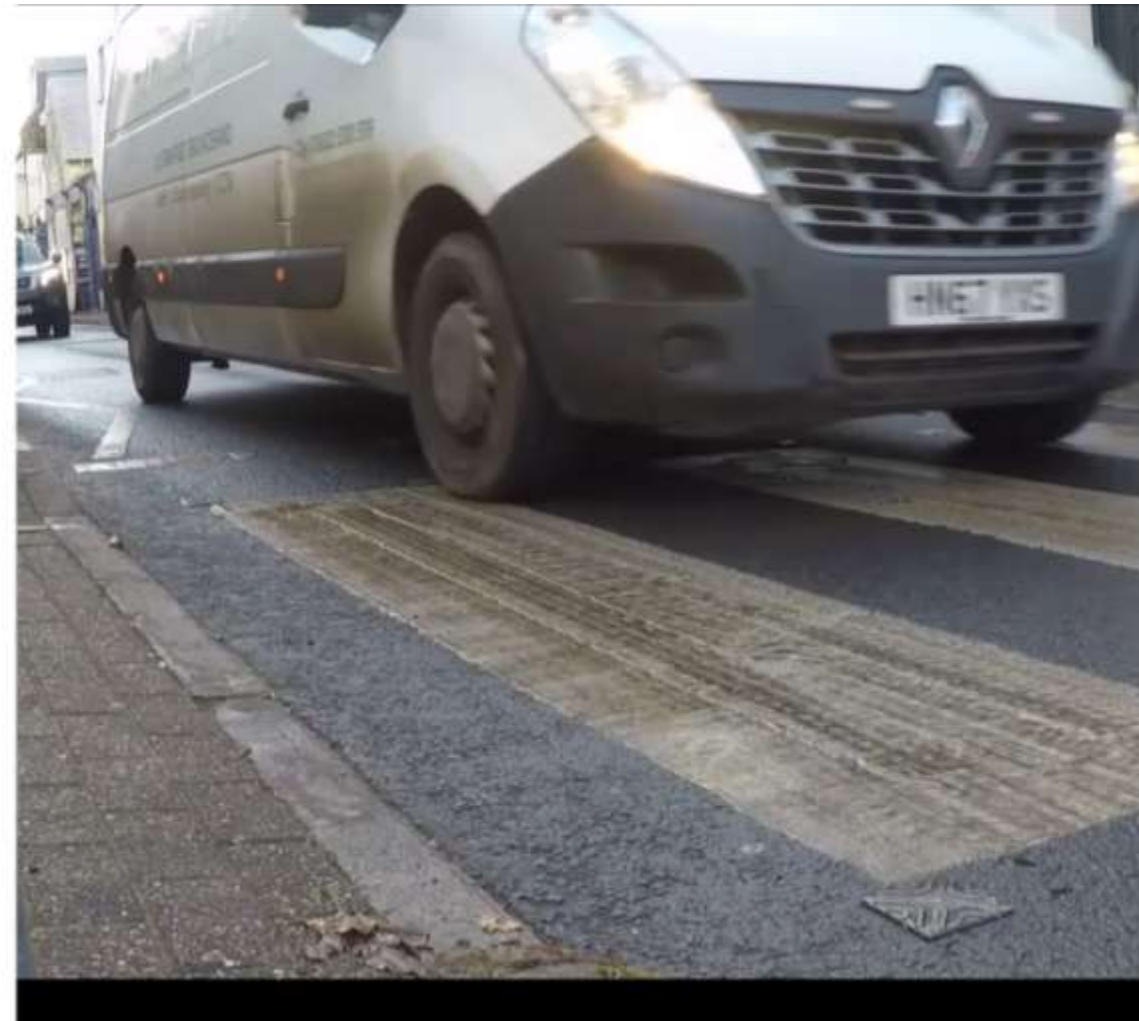
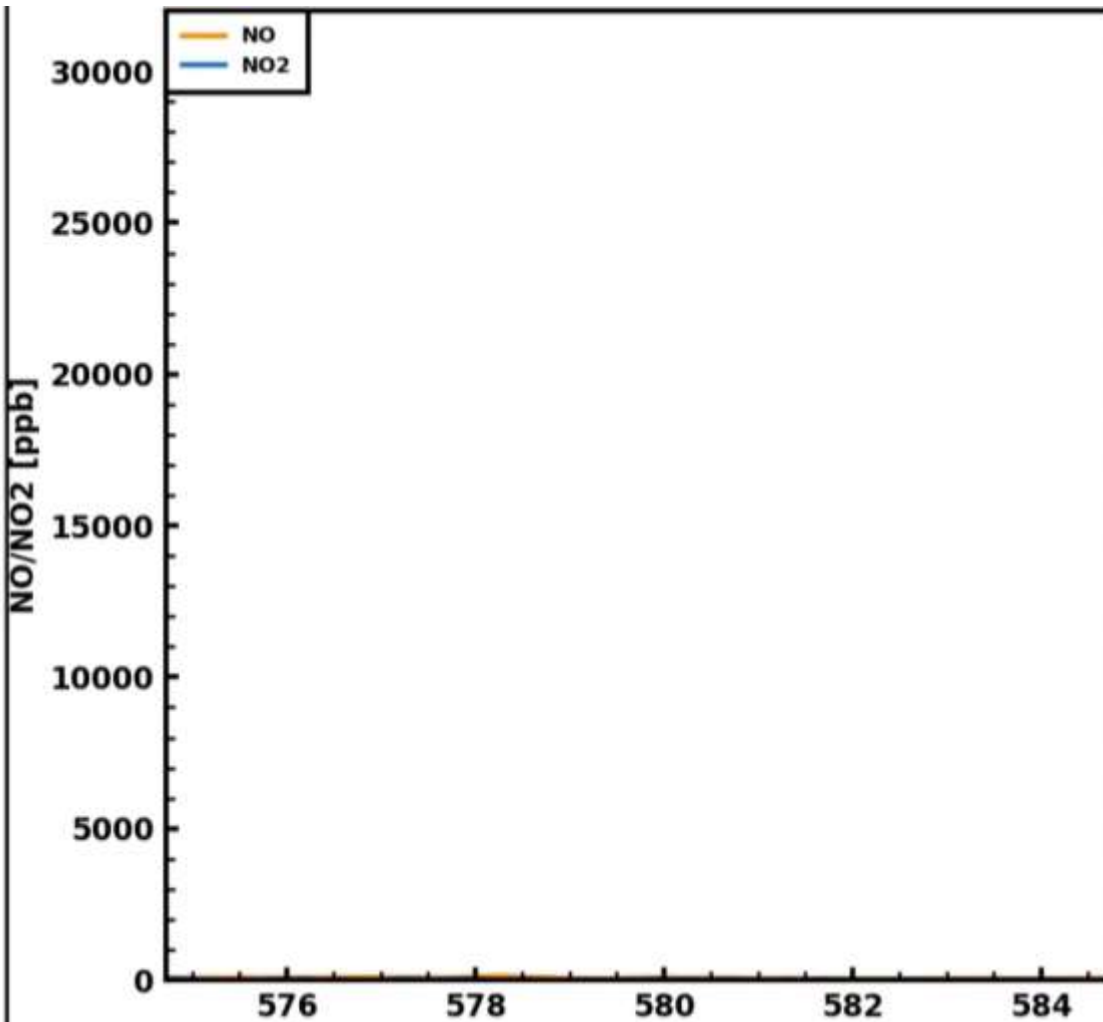


Note:...

- 470 vehicles in total
- NO_x can be expressed as ppb or $\mu\text{g}/\text{m}^3$
- Several “high emitters”
- A few high primary NO_2

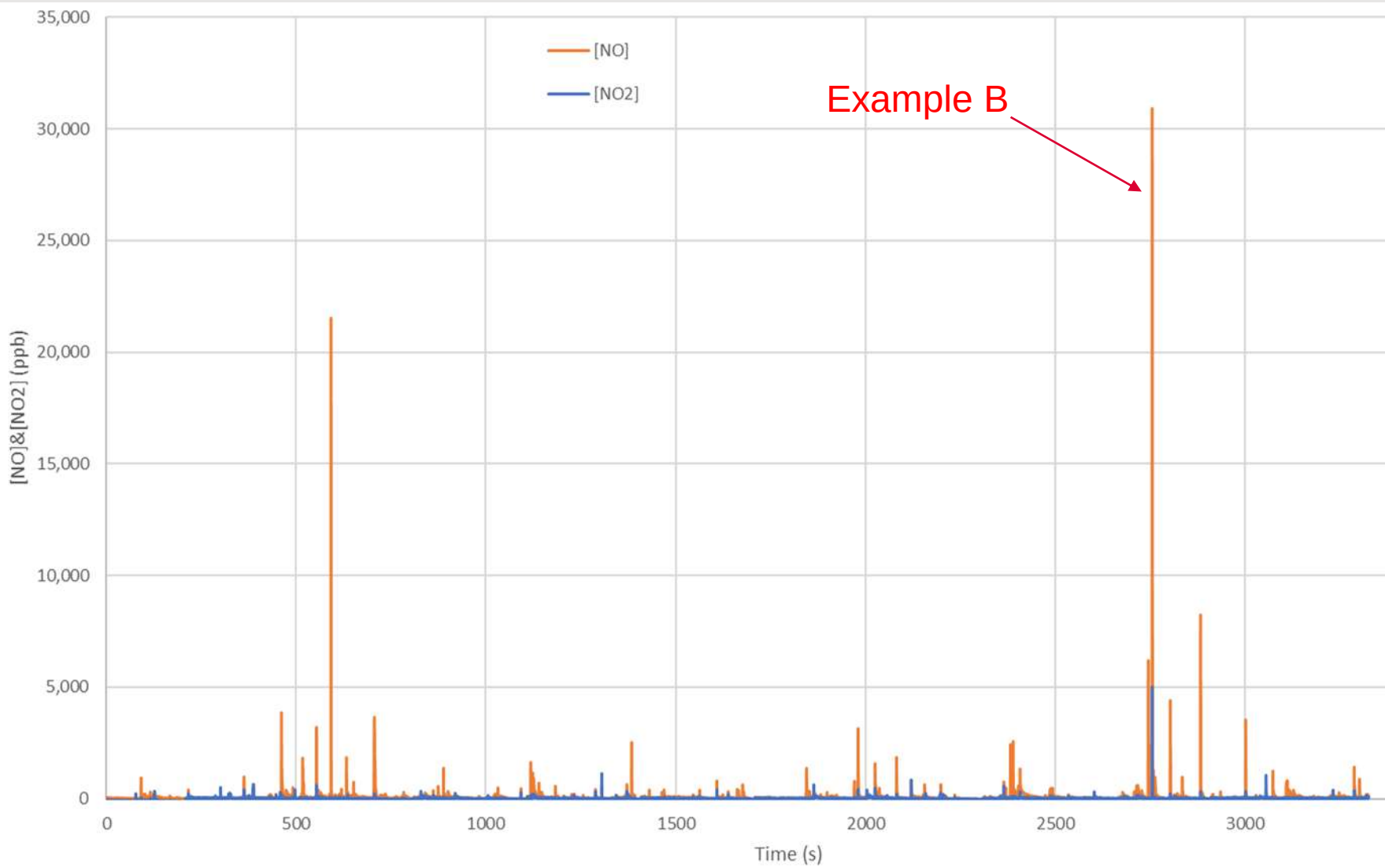
Set your threshold

Example A – DX70XKG

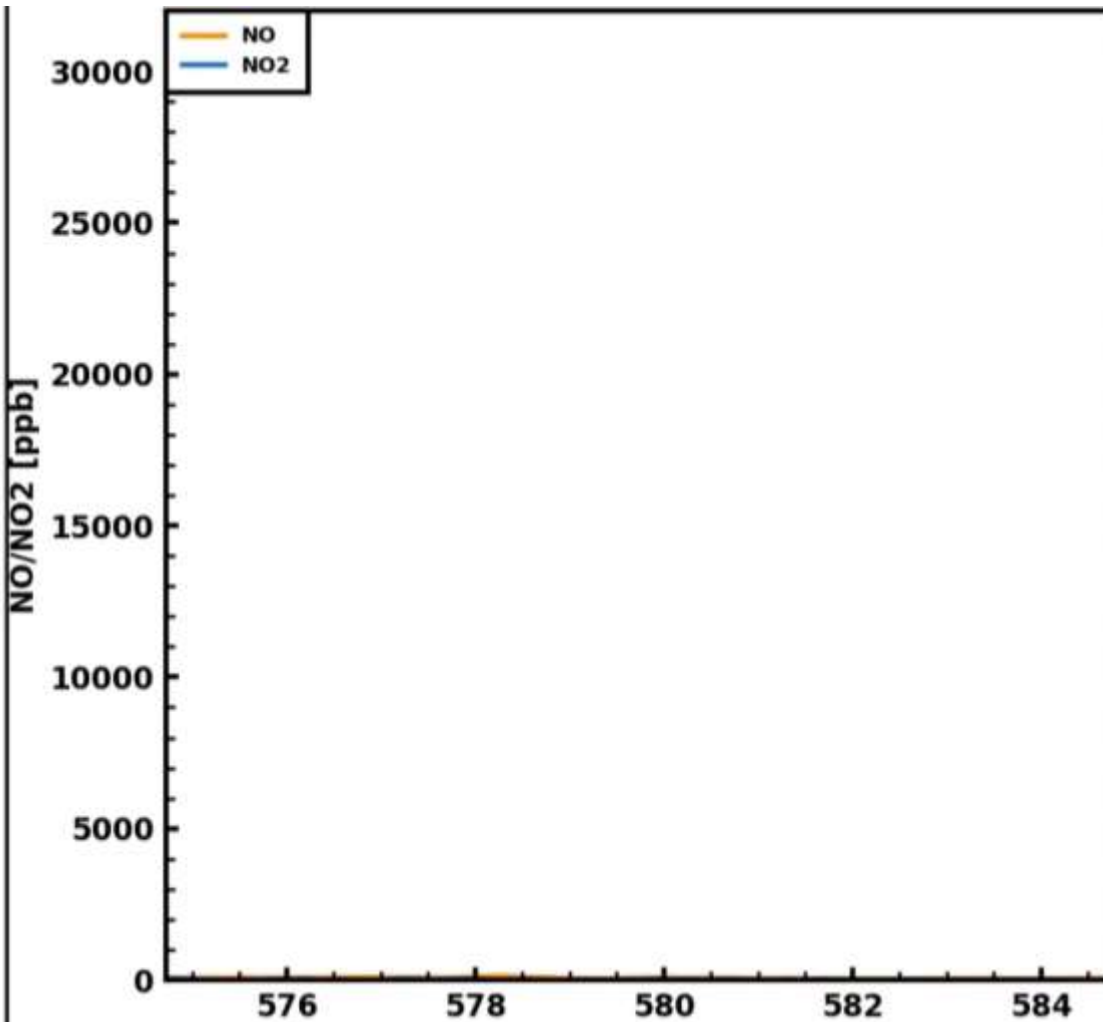


ANPR Example A - DX70XKG

Data overview



Example B – A65 BEV



ANPR Example B - A65 BEV

Total vehicles summary

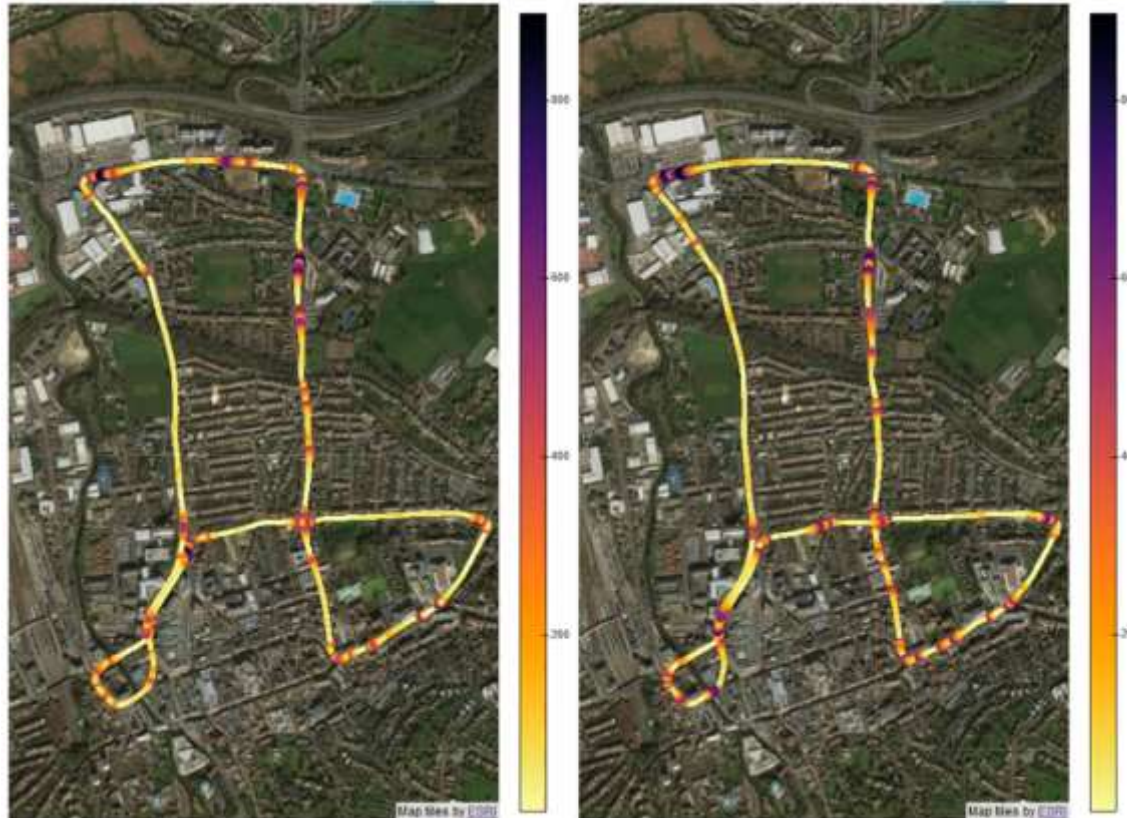
Fuel Type			Emissions Classification				Vehicle Type		
Petrol	Petrol	215	Euro 1	0			M1	385	Passenger
Diesel	Diesel	219	Euro 2	1			M3	4	Heavy Passenger
Electric	Electricity	14	Euro 3	11			N1	68	Light Commercial
Petrol Hy	Hybrid Electric	17	Euro 4	69			N2	2	Light+ Commercial
Diesel Hy	Electric Diesel	4	Euro 5	148	Euro 5	66	N3	4	Heavy Commercial
			Euro 6	114	Euro 5a	23			
			Euro 6d	120	Euro 5b	59			

Future Developments

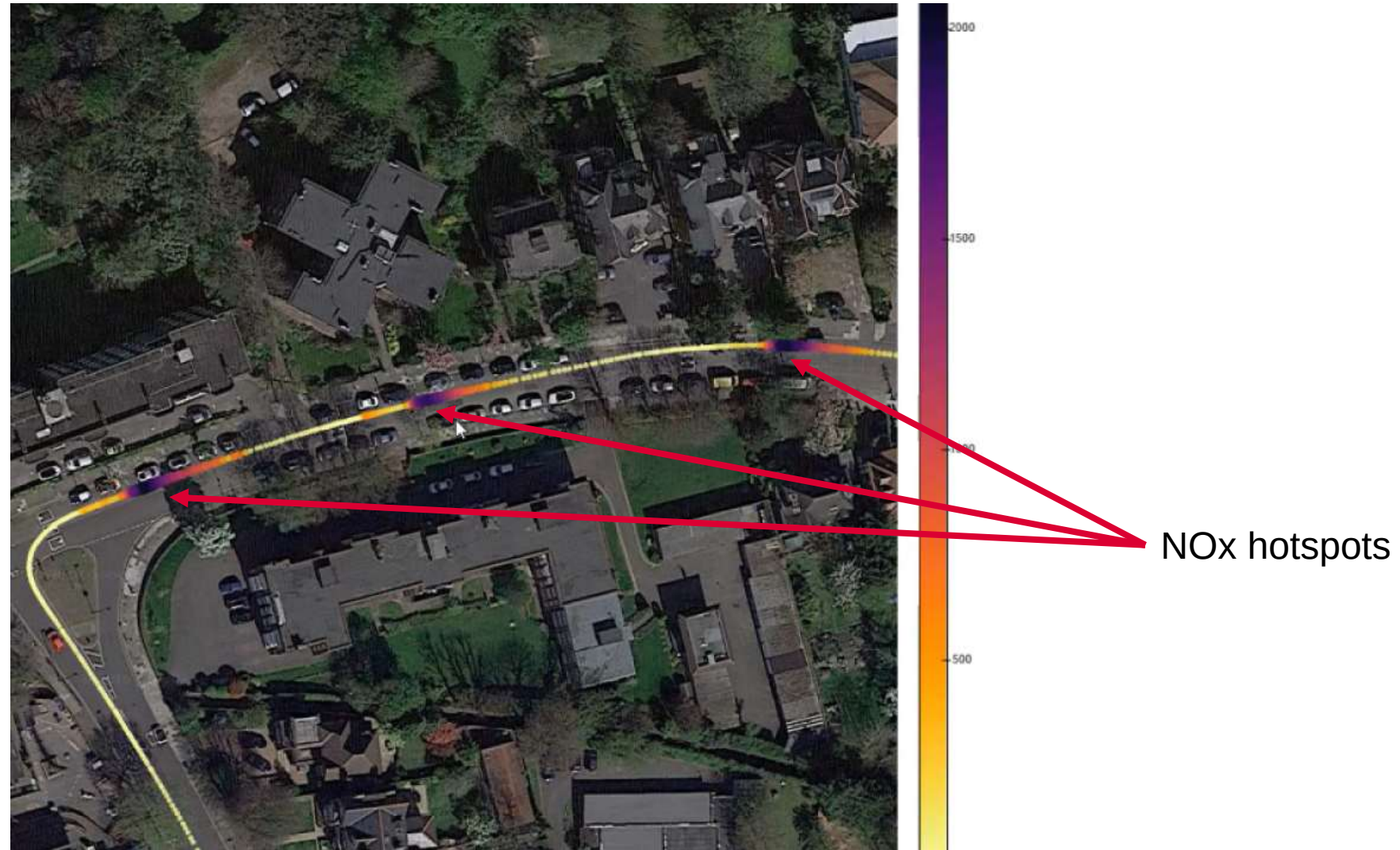
- Deploy a 24hr operational cabinet – provide weeks of vehicle emissions analysis
- Real time identification of **gross emitters**

Additional available measurements

- Measurement of exhaust dilution via fast CO₂
- Fast Particle Number
- Candidate vehicle on-board tailpipe emissions measurement yielding NO_x “hot spot” locations...
- “Chase” measurements



Additional available measurements



Contact details

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