

# Noise & Emissions Remote Sensing of Motorcycles in Barcelona and beyond



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This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101056777

**LONS** L-vehicles Emissions and Noise mitigation Solutions

# Content

- Remote sensing methods
- Objectives
- Measurement scope
- Preliminary results

# Remote sensing methods $\approx$ 1990 $\rightarrow$

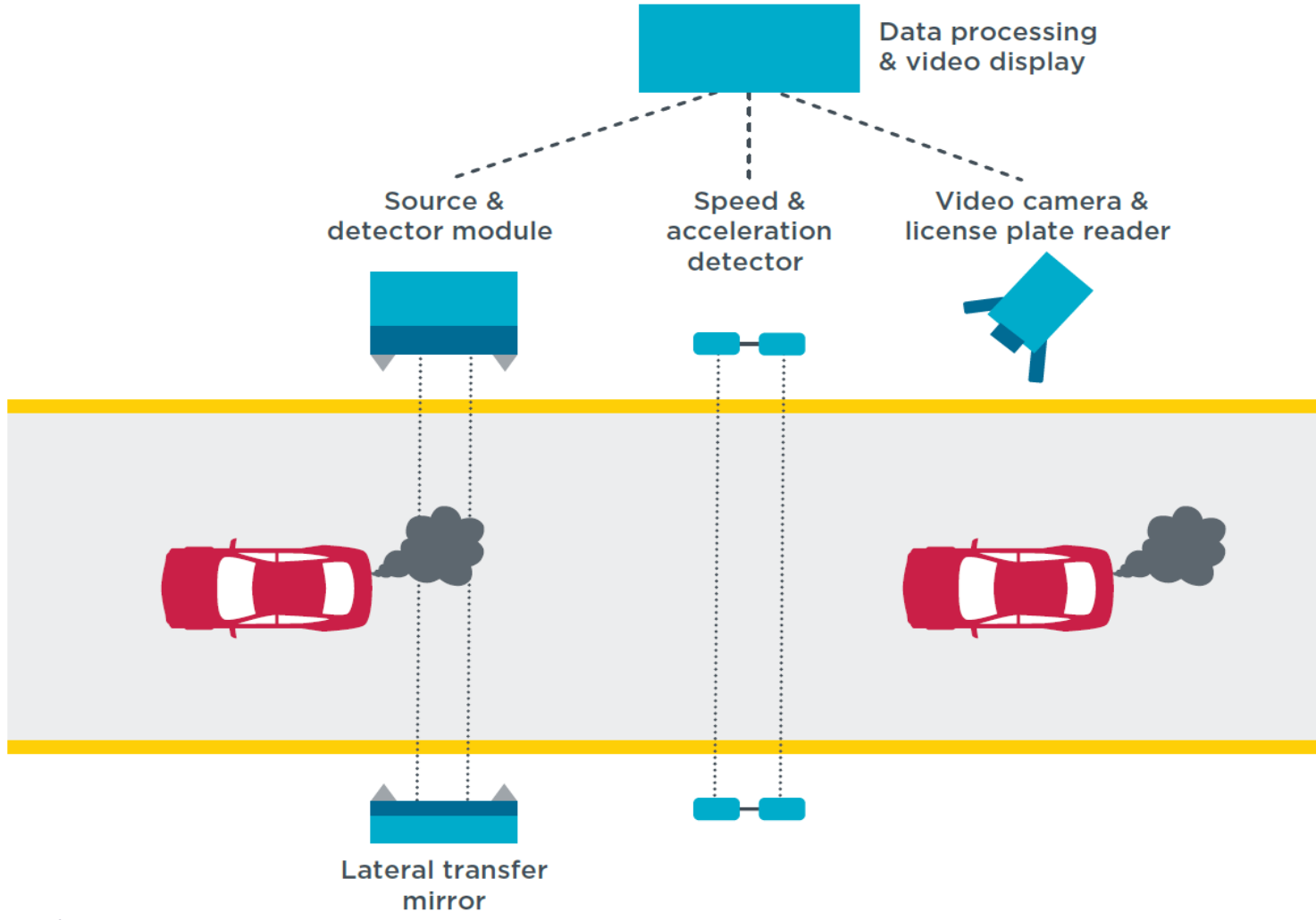
CO, HC

$\rightarrow$  NO, NO<sub>2</sub>, PM  $\rightarrow$

PN, BC



# Measurement principle



# Objectives

- Deploy roadside detection techniques in field surveys to screen for tampered LVs
- Link results from screening surveys directly to roadside inspections screened LVs
- Define criteria to identify tampered LVs supported by LENS onboard and test-bench data
- Synthesize the survey results to propose mitigation actions to prevent tampering of LVs

# Measurement scope

- Measure noise & pollutant emissions from  $\geq 3,000$  LVs from the roadside in three cities
- By means of authorized staff pull over  $\geq 300$  LVs subject to roadside inspections

# Leuven survey 13-16 May

Donkerstraat



Tiensestraat



# Setup

4. Roadside inspections





# Roadside inspections



- Check of driver documents (certificates)



- Driver interview
- Visual inspection

**LNS** L-vehicles Emissions and Noise mitigation Solutions

WT 5.3 Roadside inspection form

General and vehicle info 154

Date	
License plate no.	SBQC 608
Make	Derbi
Model	Senza XTREME
Engine type (2-stroke or 4-stroke)	2
Engine displacement	50
Model year	2003
Euro class	
Mileage	19 984
Other	muffler afterburner

Measurement checks

% CO idle	4,1
ppm HC idle	14000

5500 : 91,9

# Paris region survey 16-21 September

Rueil Malmaison



Dampierre en Yvelines



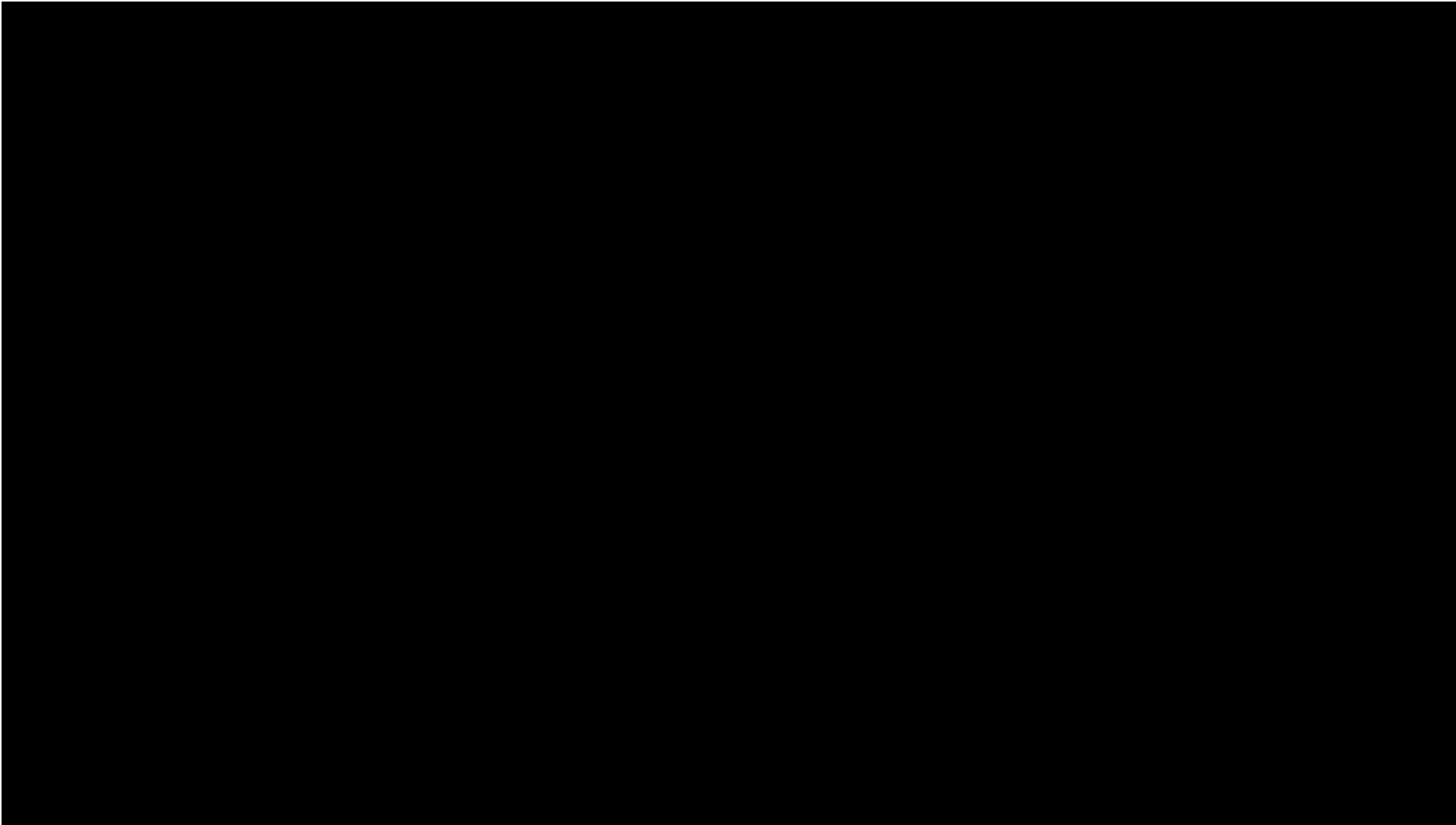
# Rueil Malmaison



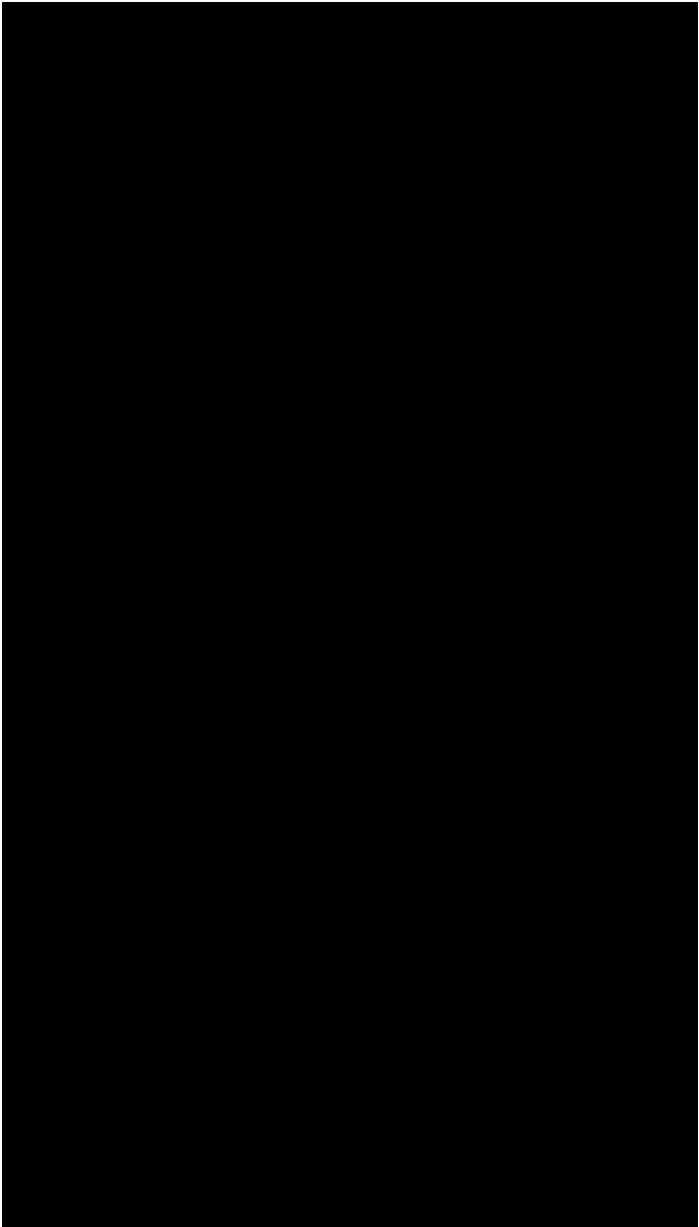
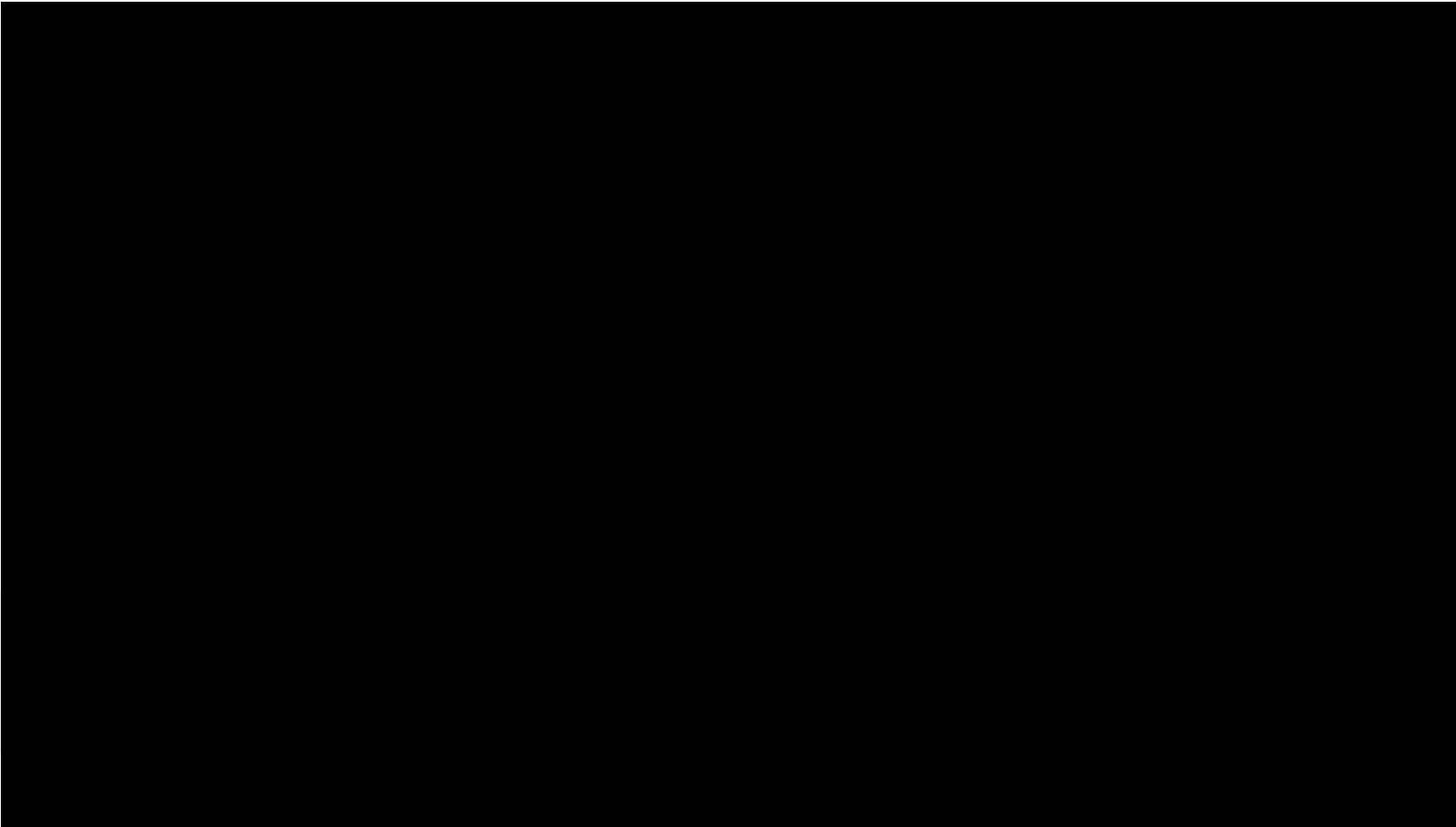
# Dampierre en Yvelines



# Barcelona survey 14-18 October - Via Augusta



# Barcelona survey 14-18 October - Via Augusta



# Some preliminary results

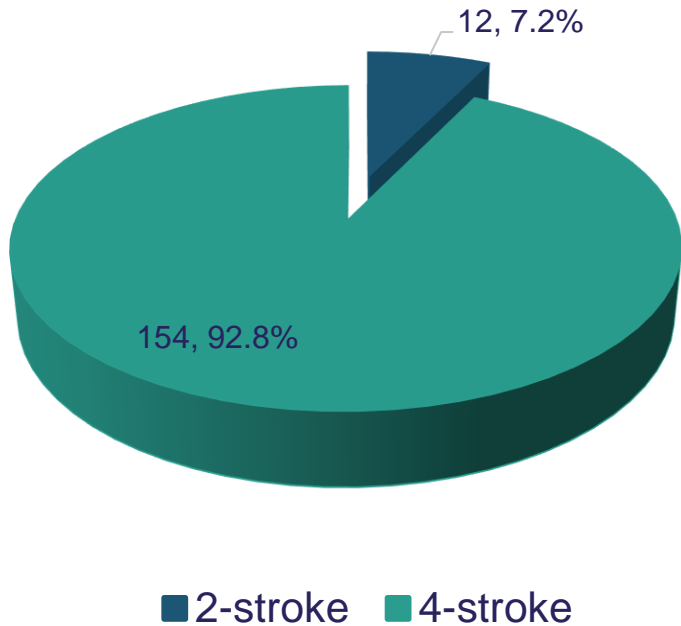
# Leuven

- About 400 LVs were measured in four days
- Of these, about 170 were pulled over and subject to a roadside inspection

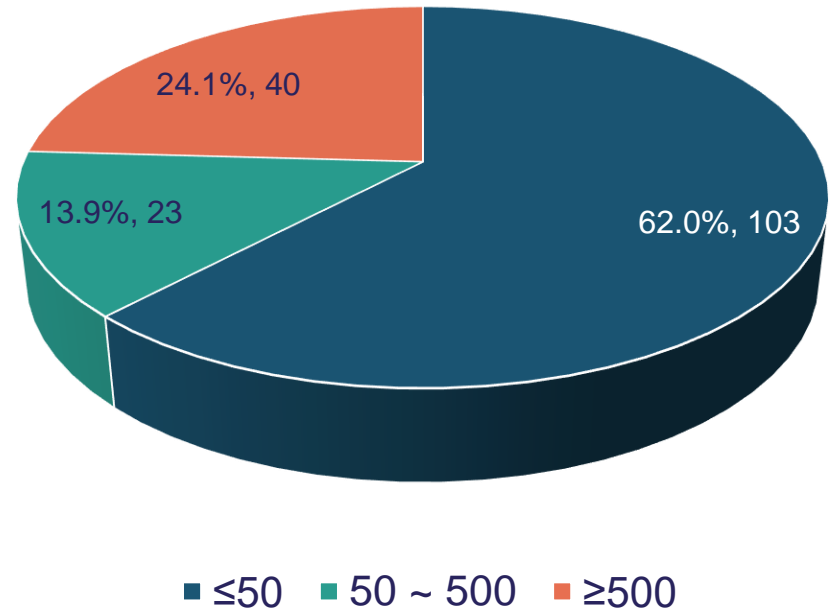


# Engine type and size distribution

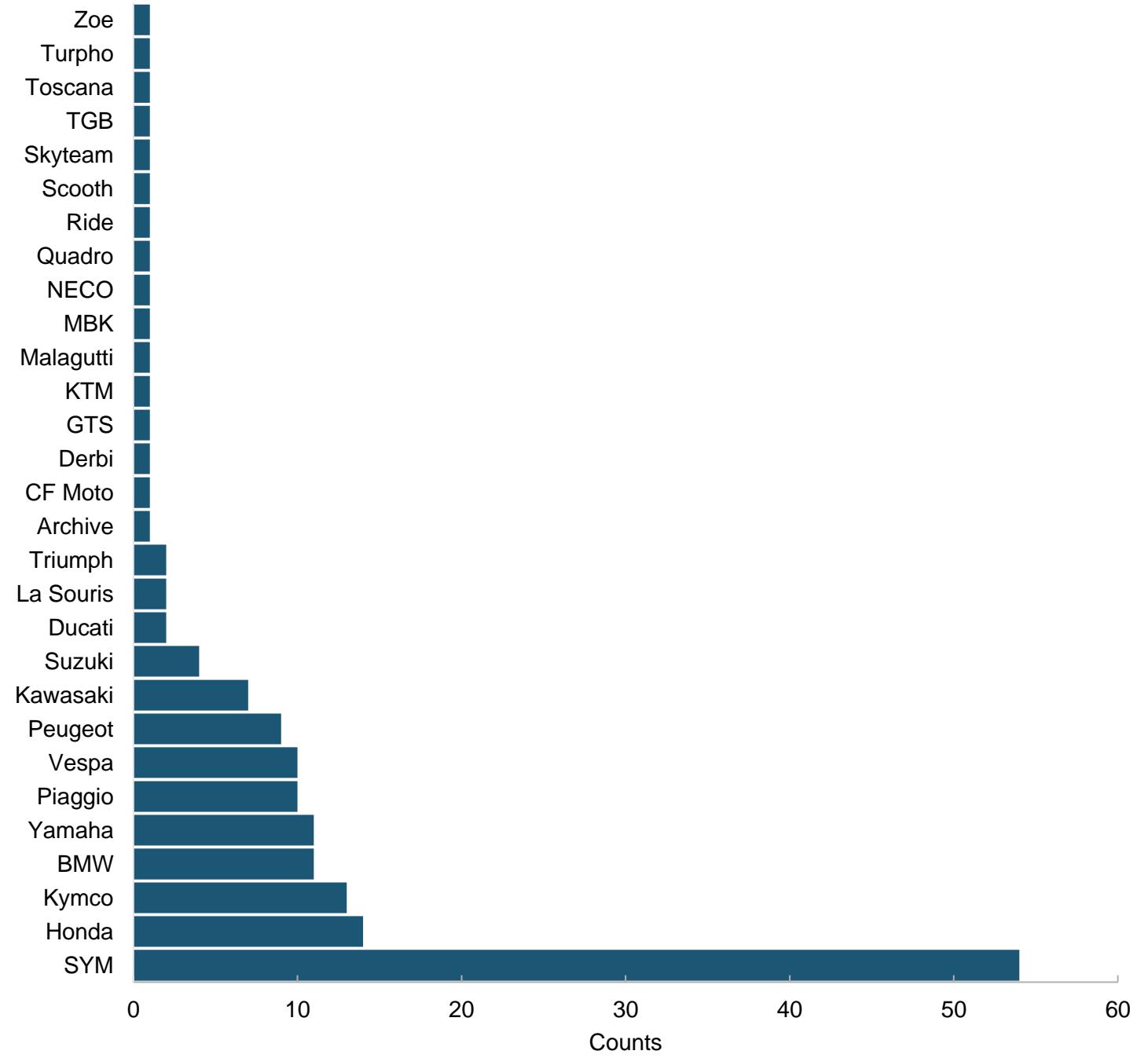
Engine type



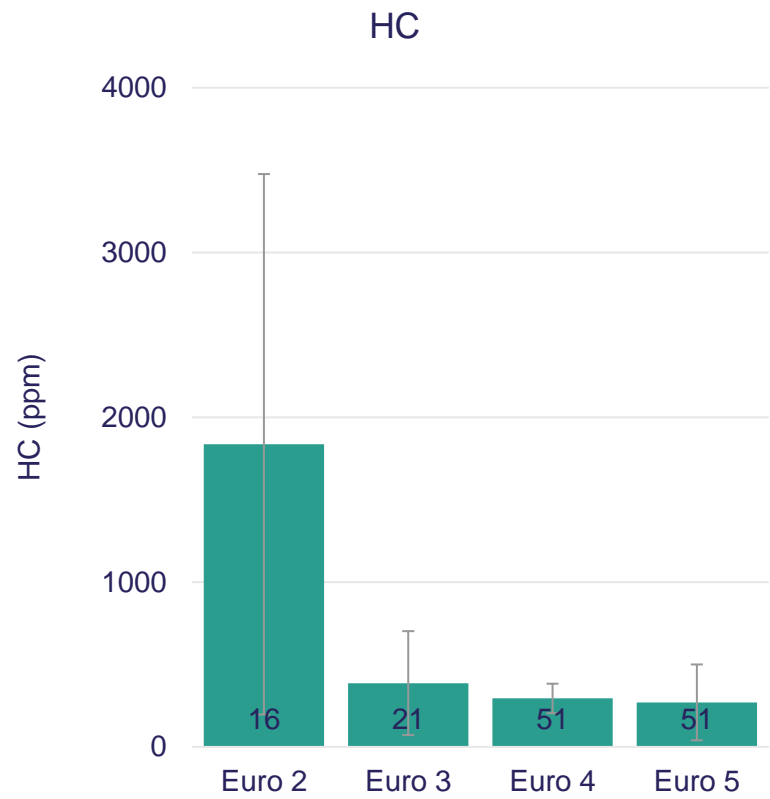
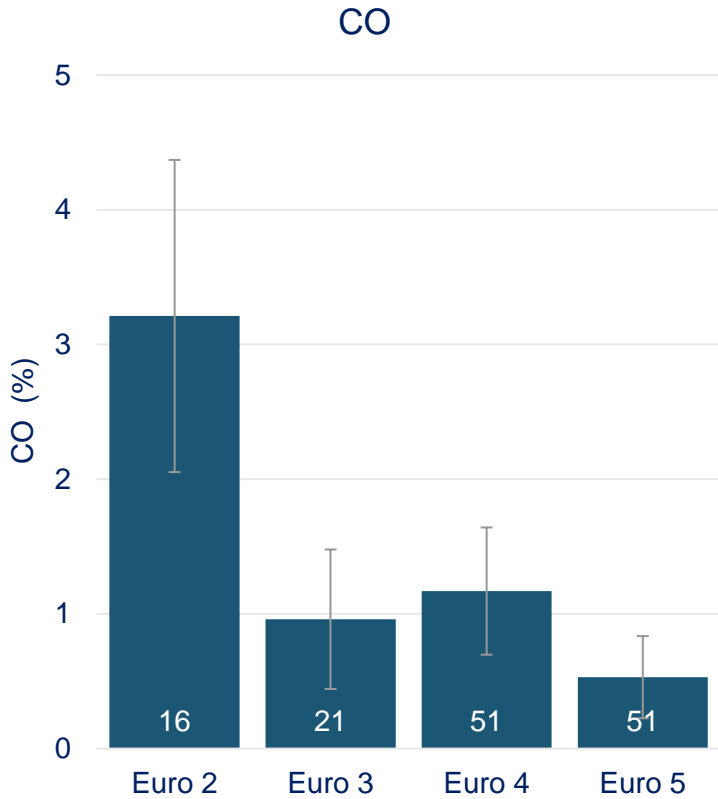
Engine displacement



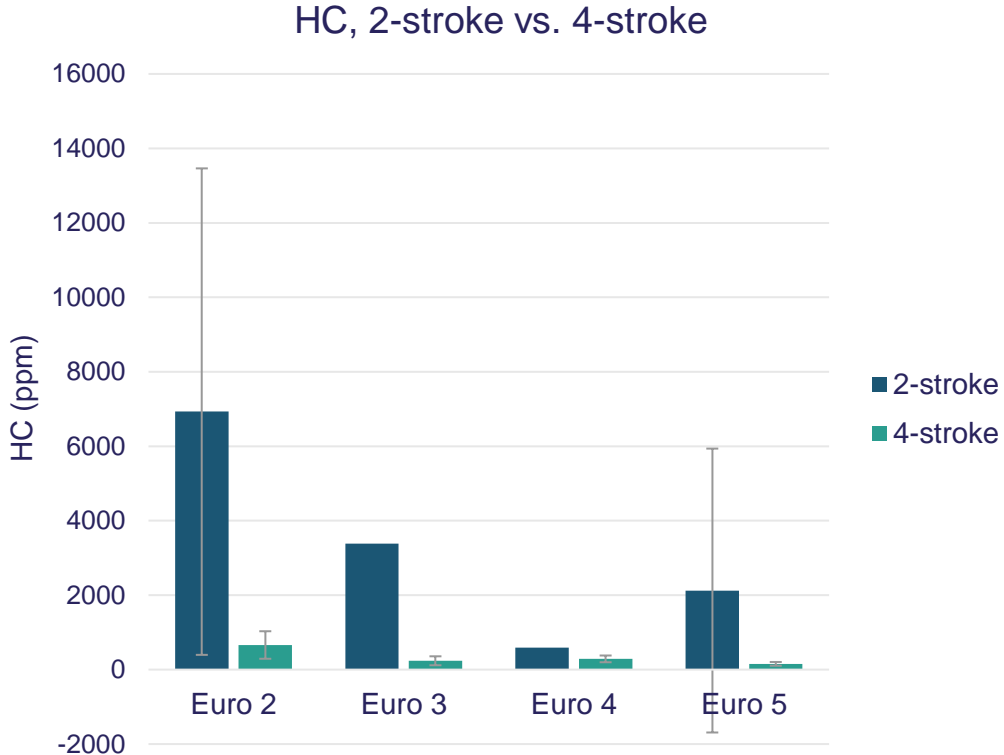
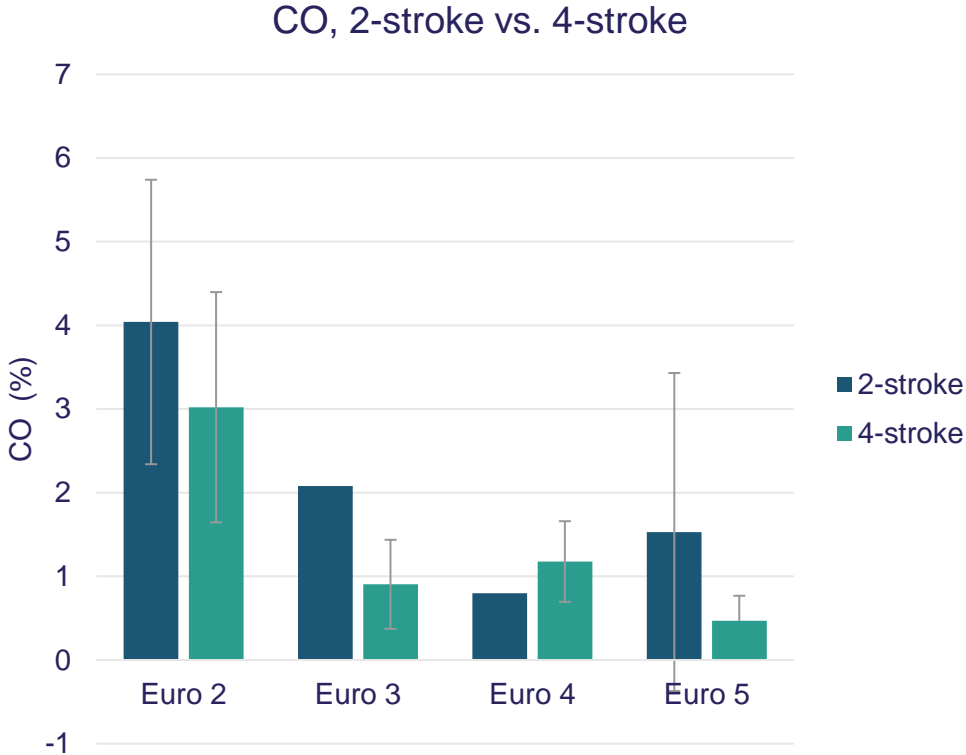
# Vehicle make distribution



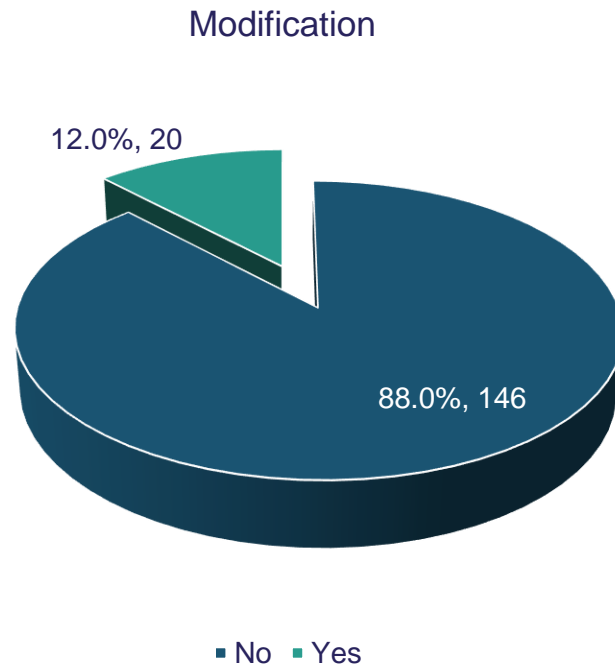
# Idle test emissions - by Euro standard



# Idle emissions – 2-stroke vs. 4-stroke



# Modifications



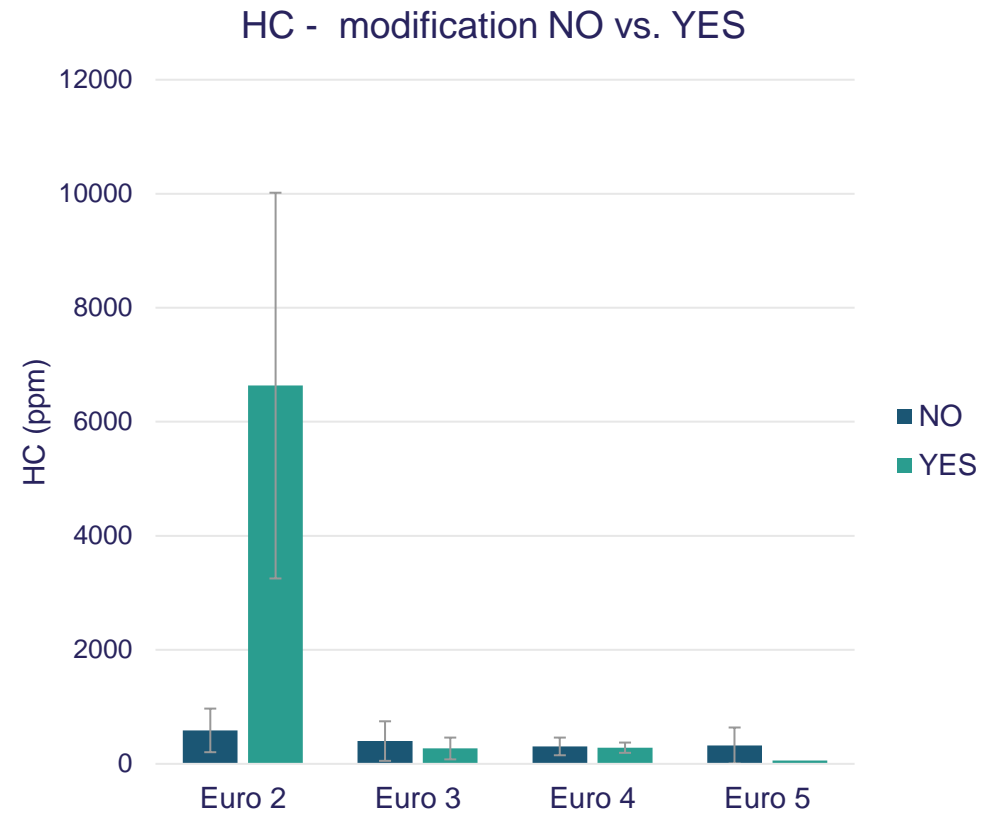
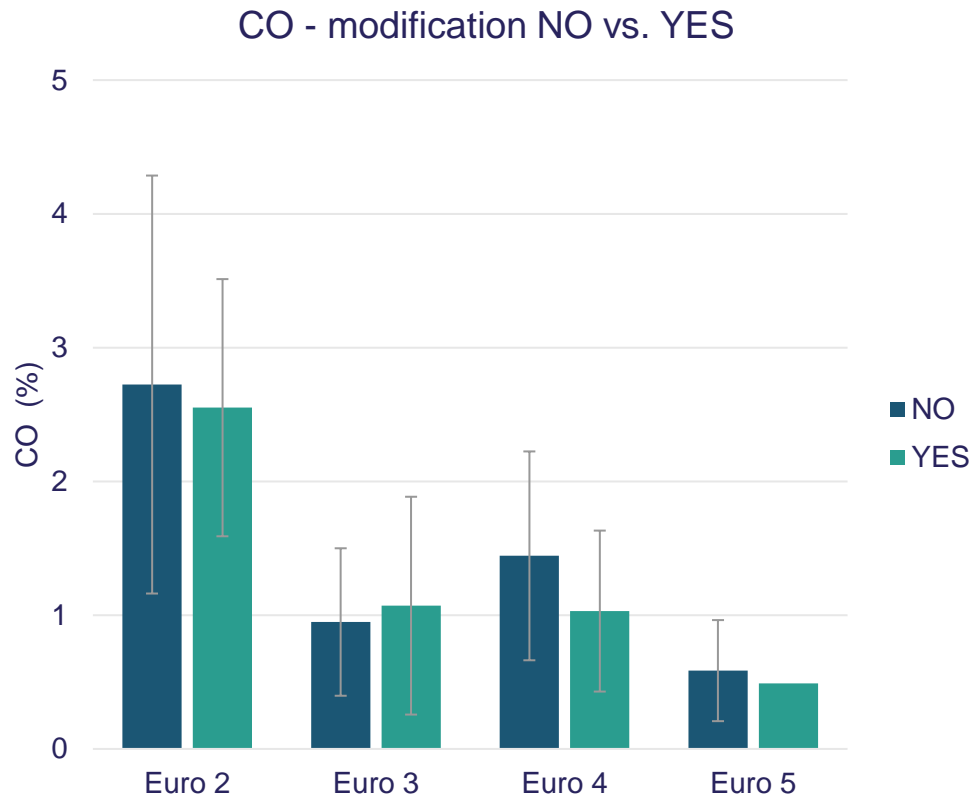
## Modification list:

1. Aftermarket muffler
2. (Akrapovic muffler)
3. Covers missing, exhaust aftermarket, racing muffler
4. Old scrambler modified
5. GPR muffler bend
6. Aftermarket ZARD muffler
7. Aftermarket exhaust
8. Cover broken, race exhaust pipe, other engine
9. Aftermarket muffler, clutch modified Ducati
10. Exhaust pipe modified, not original
11. CVT crank bearing bent, cover broken
12. Exhaust not original, muffler aftermarket
13. Exhaust + muffler
14. Exhaust not original, carburettor
15. Exhaust SAI missing
16. Exhaust pipe modified (race)

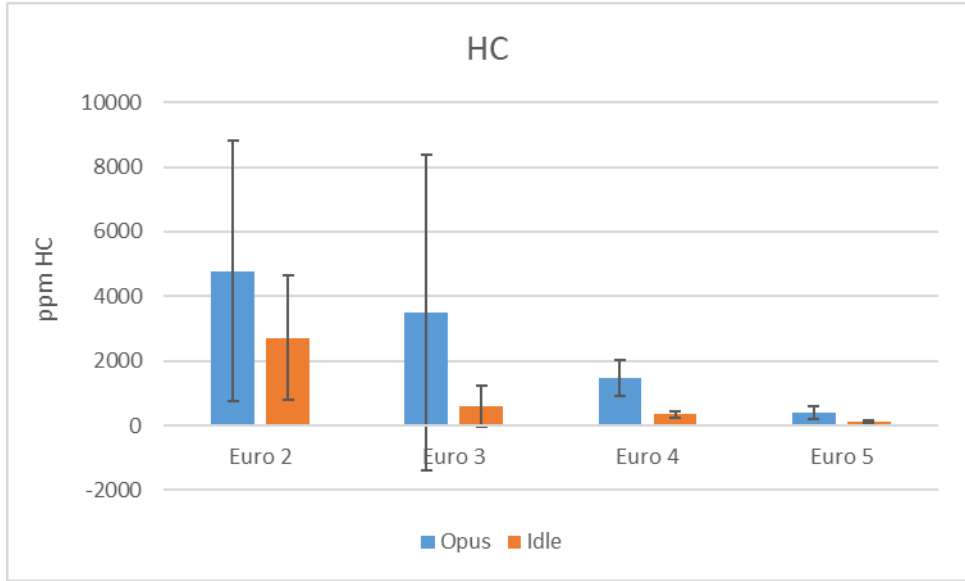
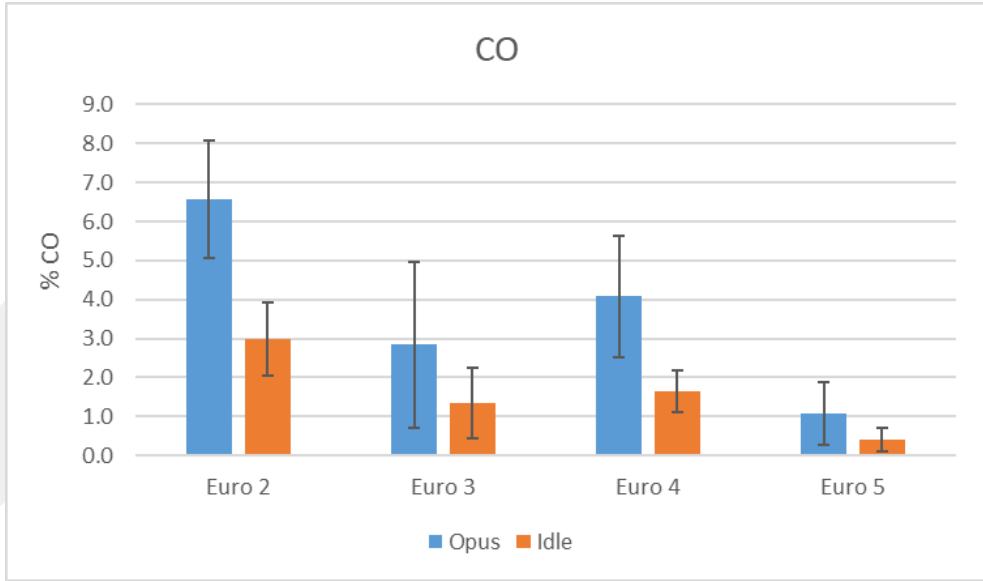
## No modification but notes:

1. Engine cold
2. Hole in exhaust, rusty exhaust pipe
3. Fairings broken
4. Old exhaust pipe, rusty
5. Old and rusty exhaust pipe
6. New mc with Akrapovic muffler
7. Rusty exhaust pipe
8. Akrapovic muffler
9. Aftermarket
10. Rusty exhaust pipe
11. High idle
12. Old exhaust pipe
13. Rusty exhaust pipe, high idle

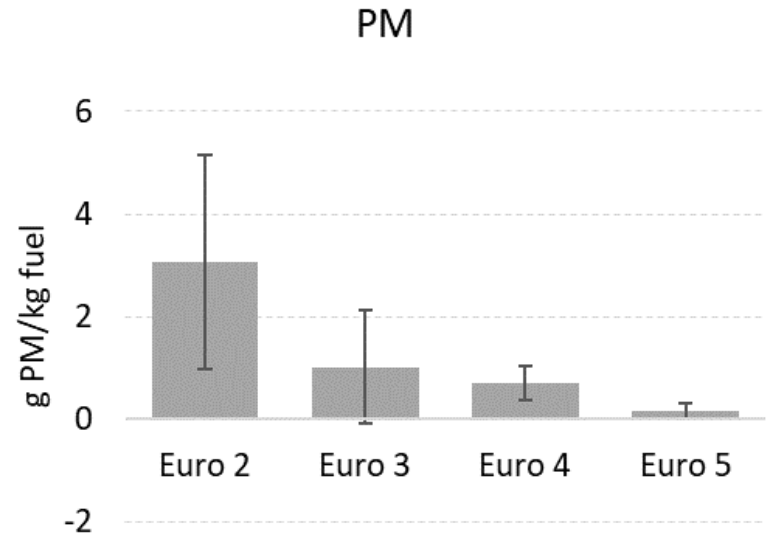
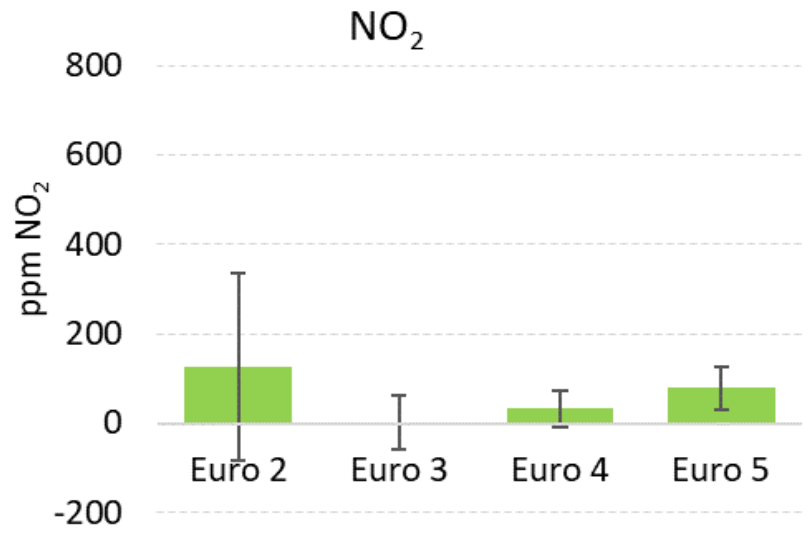
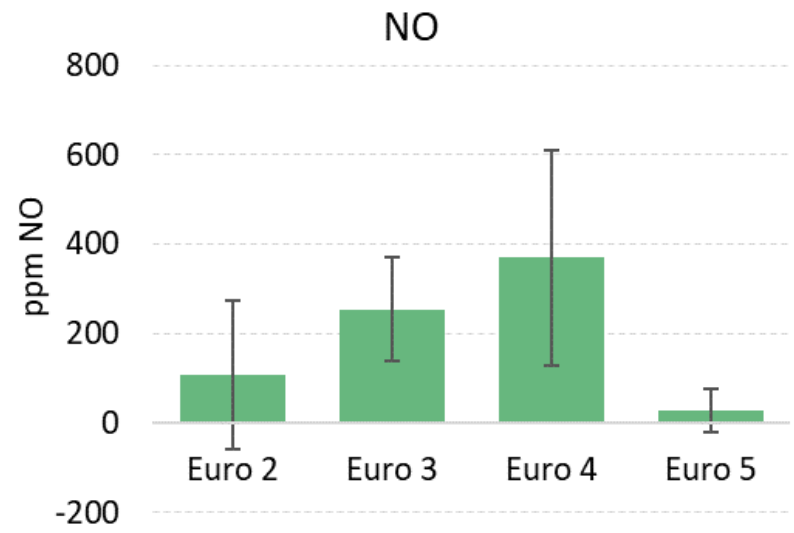
# Idle emissions – w/wo modifications



# Leuven on-road remote sensing vs idle test results



# Leuven other on-road remote sensing results





# Friendly atmosphere at inspection site

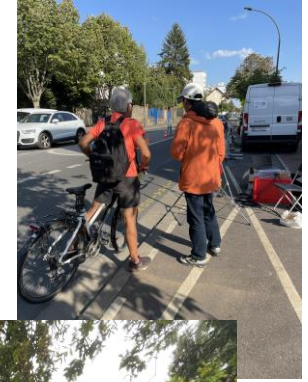


# Paris

- About 1,000 LVs measured in six days, most of them in Rueil Malmaison
- Regretfully, no police support available in Rueil Malmaison (O-/Paralympics)
- Local police carried out independent roadside checks in Dampierre



# Large interest from the public



# Barcelona – one hour ago...



# Thank you for your attention!

## Questions?

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