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Baden-Württemberg Ministry of Transport

LENS -

L-VEHICLES EMISSIONS AND NOISE MITIGATION SOLUTIONS

- 5 M€ EU RI project
- 15 partners:
 - Research institutes
 - Universities
 - OEMs
- Sep 2022 Sep 2025





https://www.lens-horizoneurope.eu/

L-vehicle Noise & Air Pollution Challenges

- LVs mostly do not require regular inspection
- LV emission tests are done only in laboratory environments
- Cities lack L-vehicle-specific mitigation policies
- LV noise pollution in urban & rural environments is significant



LENS objectives

- Develop beyond state-of-art LV pollutant emission and noise measurement techniques
- Characterise LV's noise and pollutant emissions
 performance
- Carry out in-field identification of tampered LVs in 3 cities
- Provide recommendations and expected impact of decreasing noise and pollutants from LVs



L-category vehicles (LVs)



New instruments developed





Measurements in the lab and on the road



LV tampering/modification



In-field tampering surveys

Leuven 13-16 May



Paris region 16-21 Sep



Barcelona 14-18 Oct









Measurement set up



 Gaseous pollutants emissions







 Particle pollutants emissions

• Noise emissions



Roadside inspections



• Check of driver documents (certificates)



- Driver interview
- Visual inspection

- CO and HC idle test
- Stationary noise test





Measurements in Leuven





Roadside inspection results

Leuven (166 LVs)



Untampered

Modifications (tampering):

- Exhaust system (45%)
- Muffler (45%)
- Both exhaust and muffler (20%)



Tampered

Barcelona (94 LVs)

Modifications (tampering):

- Exhaust system (30%)
- Muffler (30-55%)
- dB killer (30%)

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Untampered

Both muffler and dB killer (30%)



Tampered

Roadside idle test vs on-road emissions – CO and HC by Euro standard (Leuven)







On-road nitrogen oxides and particulate matter emissions by Euro standard (Leuven)







Initial conclusions

- Tampering affecting both noise and pollutant emissions have been proven in two EU cities
- The share of tampered L-vehicles appear to be ≈10%
- Good news is that on-road emissions of all regulated pollutants from L-category vehicles on average have been substantially reduced from Euro 2 to Euro 5
- Noise measurements need further analysis





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Thank you for your attention!

Contacts:

Ake Sjodin, IVL Niklas Schmalholz, POLIS Leonidas Ntziachristos, Emisia ake.sjodin@ivl.se nschmalholz@polisnetwork.eu leon@auth.gr

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