LENS PROJECT

(June 2024)

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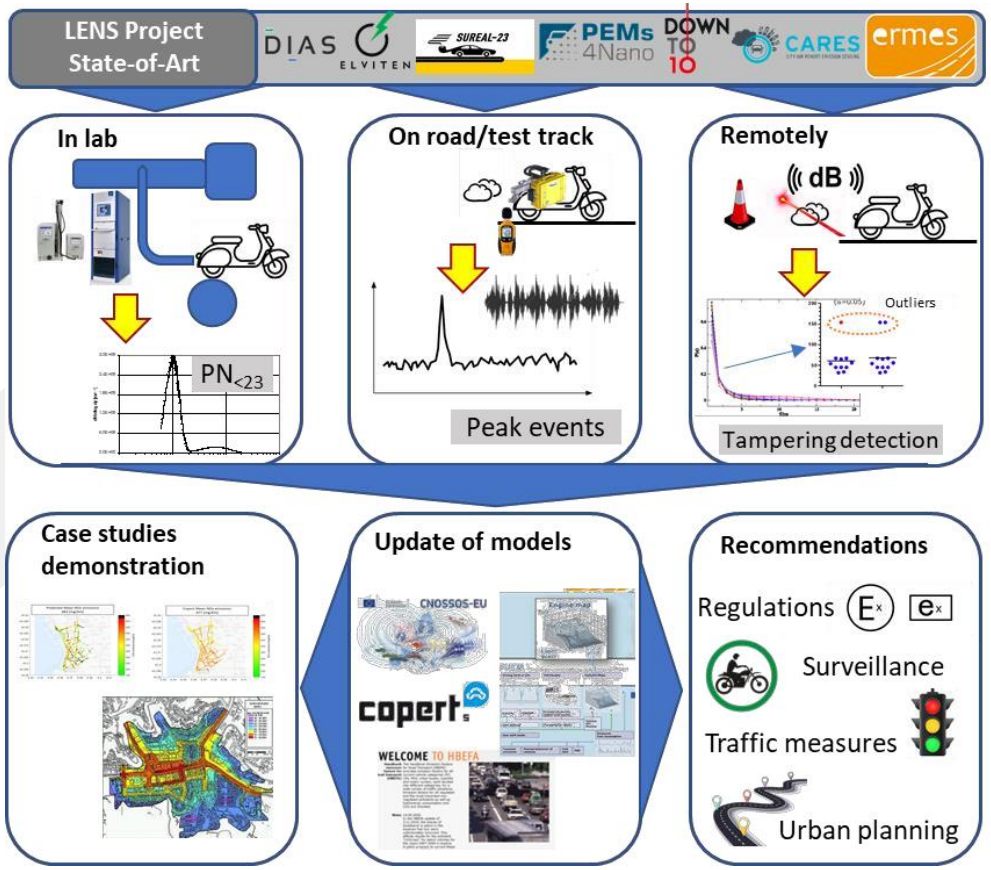
L-vehicles Emissions and Noise mitigation Solutions

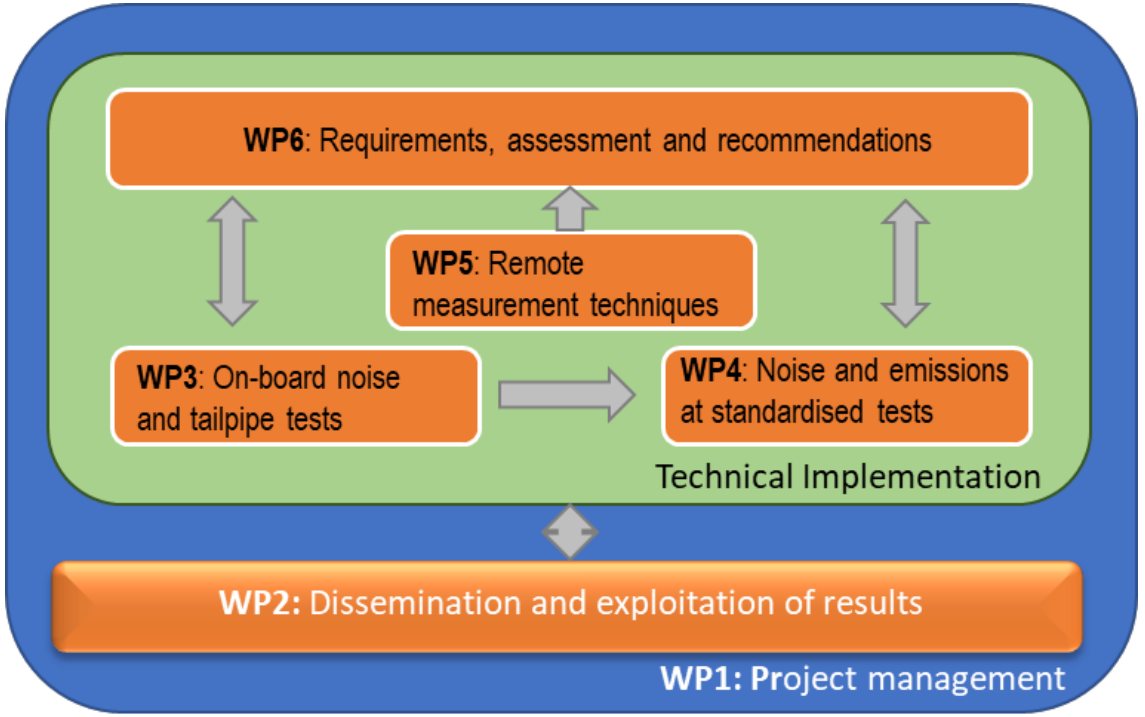
Agenda

1. Overview & Objectives
2. Measurement procedures

Overview & Objectives

Methodology & Structure





15 partners

- R&D providers
- Academic institutes
- OEMs
- Systems supplier
- Communication partner

LENS L-vehicles Emissions and Noise mitigation Solutions

Agenda

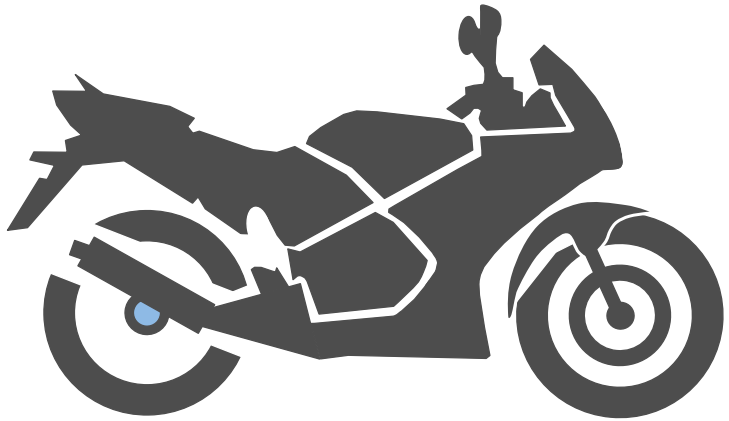
1. **Overview & Objectives**
2. **Measurement procedures**

Measurement procedures

Noise emissions

On-road & on-board

Derivation of critical driving conditions



Real world driving circle on test track

Comparison

Type approval (TA) on test track

Measurement procedures

Noise emissions

On-road

- 10 sensor systems
- Detection of operating conditions with high noise emission
- Measurements will be conducted across Europe
- Derive conditions

➡ Start: 03/2024

Type Approval (TA)

- Measurements according to UN/ECE Regulations No. 9, 41, 63
- RD-ASEP

➡ Start: 03/2023

Real-world pattern (RW)

- LV operation profiles generated from on-road noise testing will be replicated on the test-track

➡ Start: 06/2024

➡ Evaluate differences in operating conditions & noise emission

Measurement procedures

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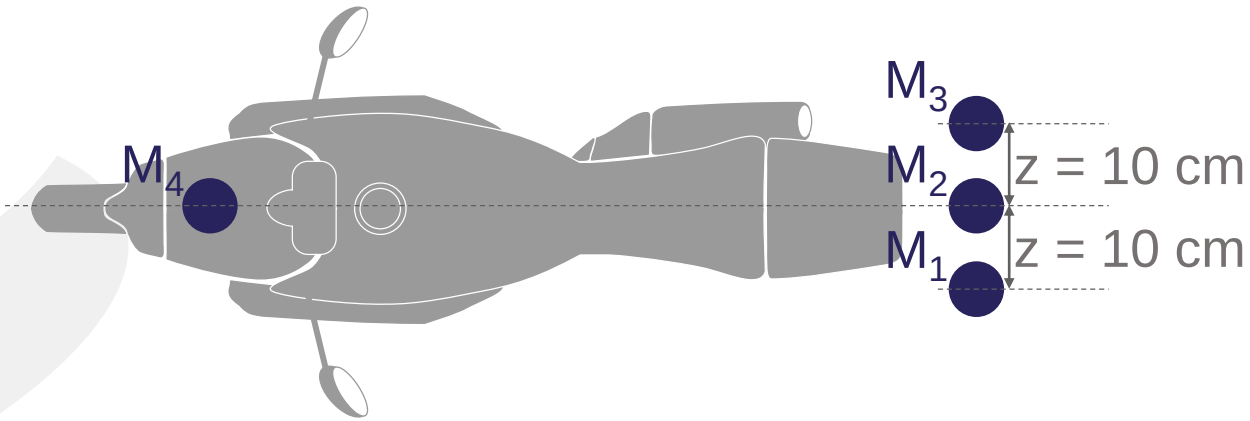
Measurement procedures

On-road – Preliminary investigations

Microphone Positions



Aim: Estimation of a suitable position for the sensor system

LENS L-vehicles Emissions and Noise mitigation Solutions

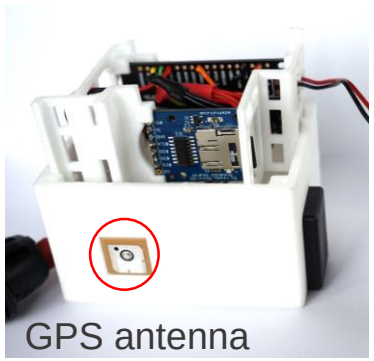
Measurement procedures
On-road – Sensor system

Sensor system for noise and GPS data logging

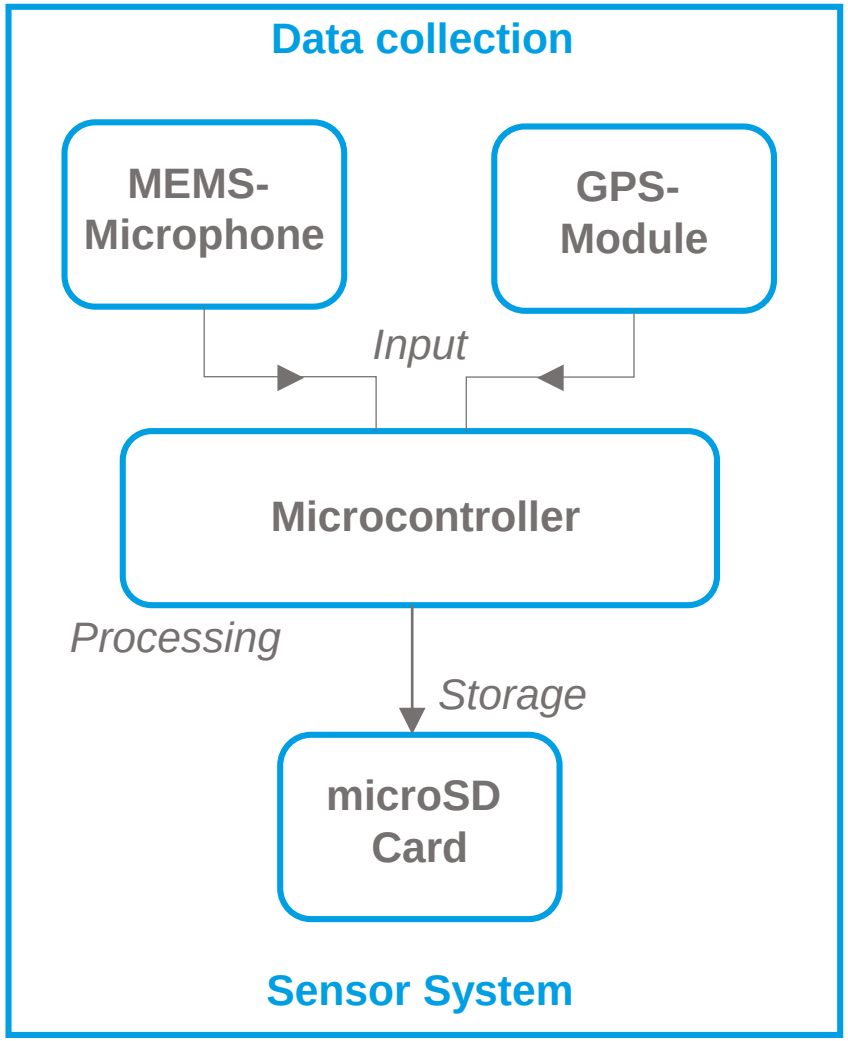
- **Components:**
  - Microcontroller (Control Unit)
  - MEMS Microphone
  - GPS Module
  - LED (User feedback)
  - Battery


Mounting


Microphone opening


GPS antenna


Sensor system with bracket



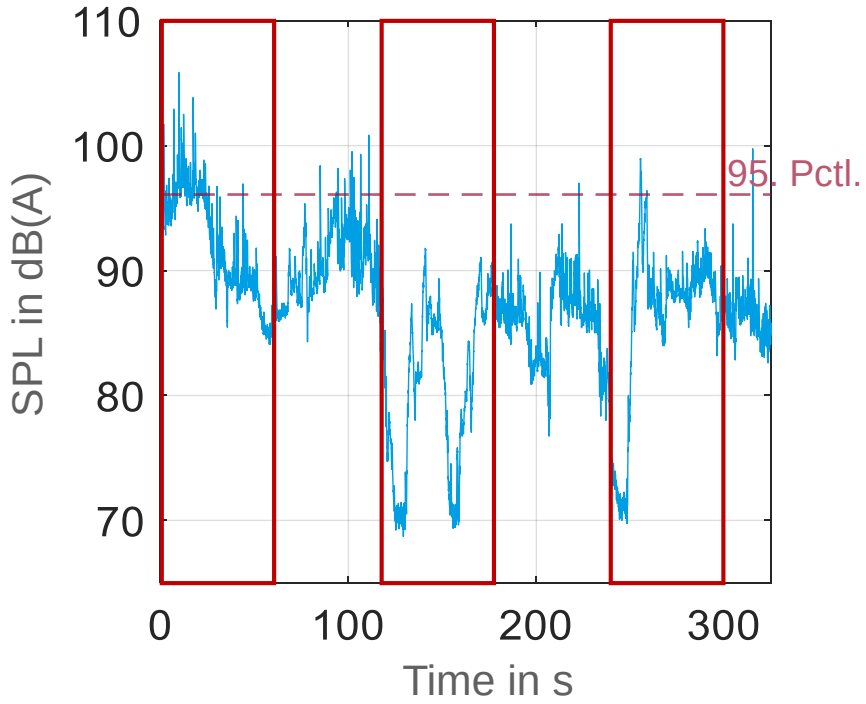
L-vehicles Emissions and Noise mitigation Solutions

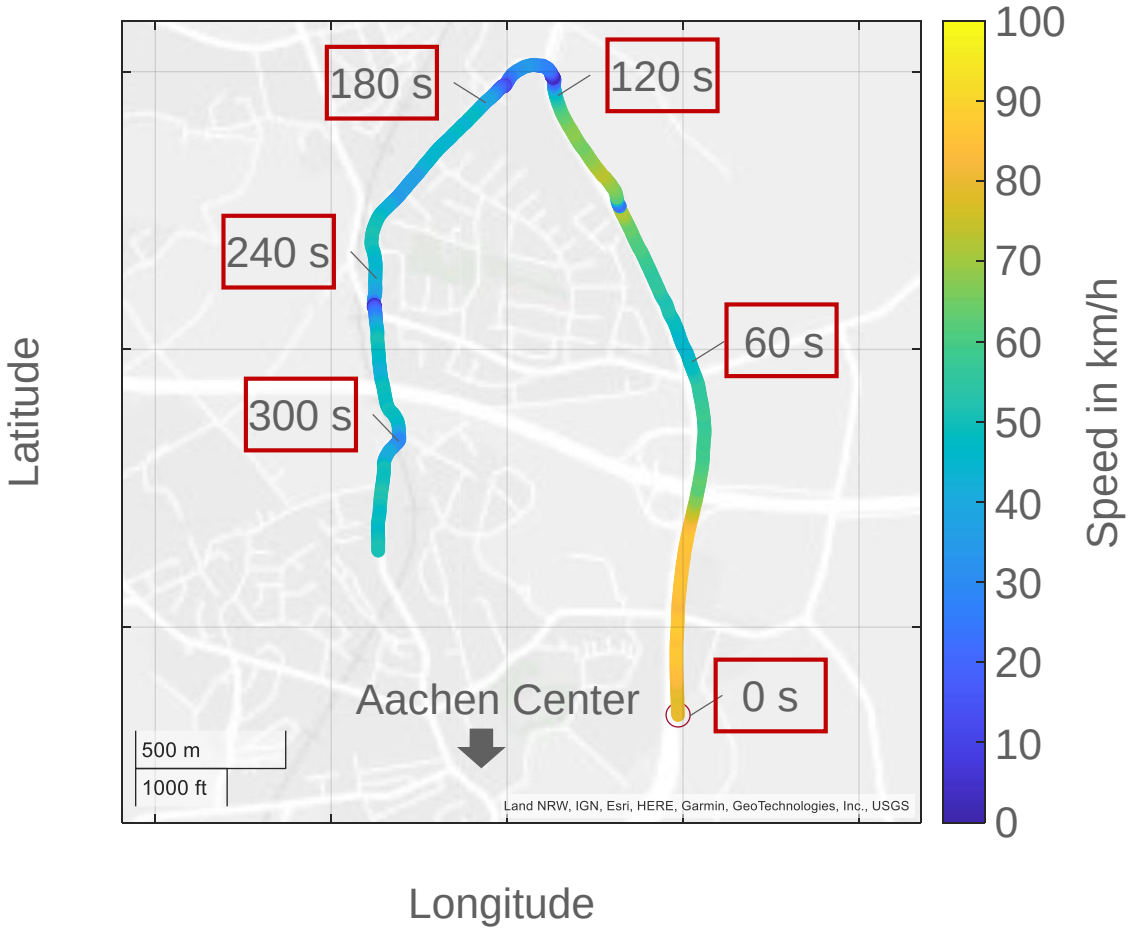
Measurement procedures

On-road – Data processing

Development of real-world driving cycle

- Identification of critical driving conditions





L-vehicles Emissions and Noise mitigation Solutions

Measurement procedures

Noise emissions

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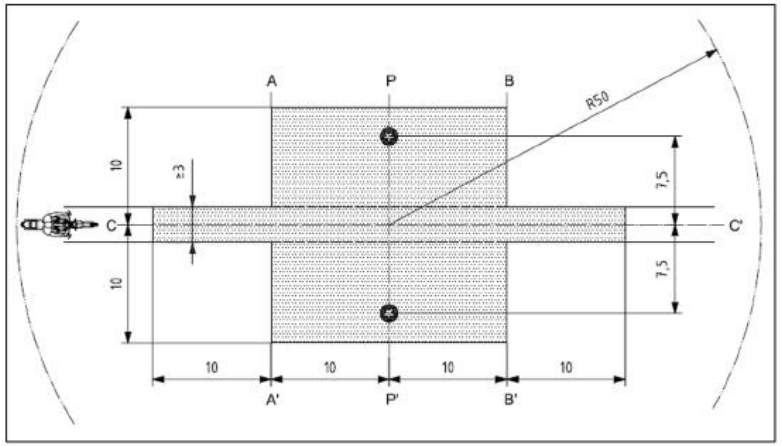
Measurement procedures

Type approval (Regulation 41)

- **Setup:**
  - Distance Microphone to line CC‘: 7.5 m
  - Distance A to B: 20 m

- **Equipment:**
  - Meteorological instrumentation (e.g. Temperature, wind speed..)
  - One or two microphones
  - Instrumentation for rotational speed
  - Instrumentation for speed measurement

- **Covered test procedures:**
  - Stationary test
  - Acceleration pass-by test
  - Constant speed pass-by test
  - ASEP
  - ➢ Focus on RD-ASEP (05 series of amendment)



Key

	Minimum area covered with test road surface, i.e. test area
	Microphone positions (height 1,2m)

Measurement procedures

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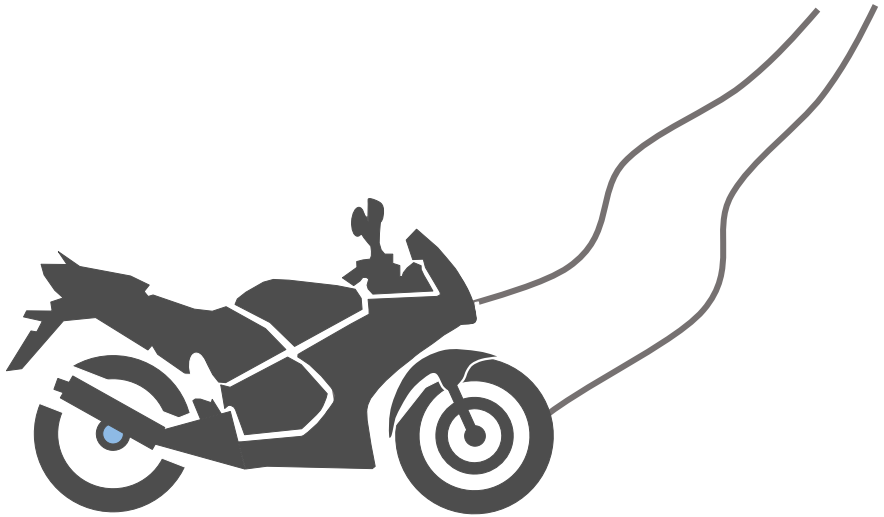
Measurement procedures

Real-world pattern

- **Real-world driving**
  - Based on the on-board on-road data a real world driving cycle will be derived applicable on test tracks
  - Differences between the type approval procedures and the real world driving pattern on a test track will be derived



Thank you!