

COOL & LOW NOISE ASPHALT

PROJET
LIFE

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LIFE E-VIA project

Electric Vehicle noise control by Assessment
and optimisation of tyre/road interaction



LIFE18 ENV/IT/000201



Ce projet est financé
par le fond européen Life
LIFE16/ENV/FR/000384

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The project in numbers



1. THE PROJECT IN NUMBERS

PROJECT LOCATION: Florence (Italy)

BUDGET INFO

Total amount: 1.797,030 Euro

% EC Co-funding: ~ 50.00%

DURATION

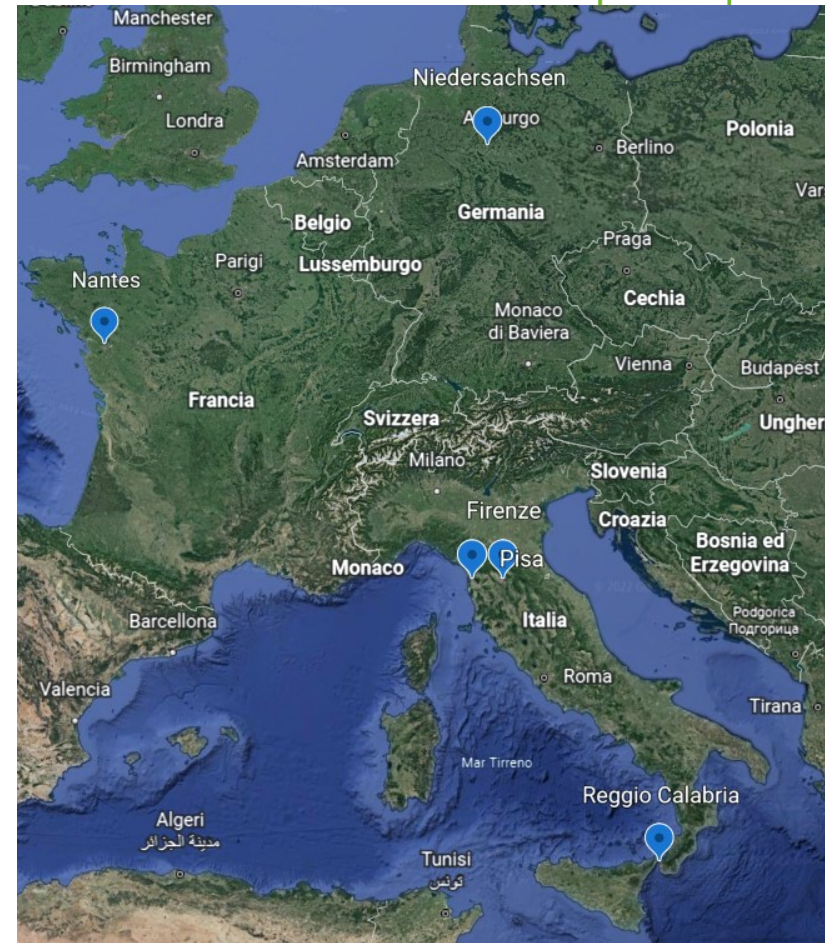
Start: 01/07/2019 End: 31/01/2023

PROJECT'S IMPLEMENTORS

Coordinating Beneficiary: Comune di Firenze

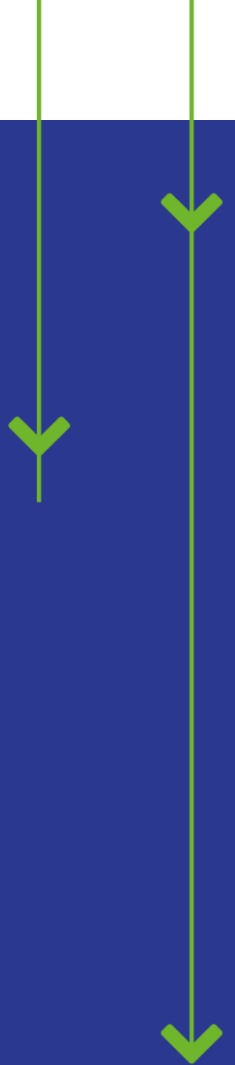
Associated Beneficiaries:

Continental Reifen Deutschland, UNI-EIFFEL, Ipool S.r.l.,
University of Reggio Calabria, **Vie en.ro.se Ingegneria s.r.l.**



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Objectives and scope

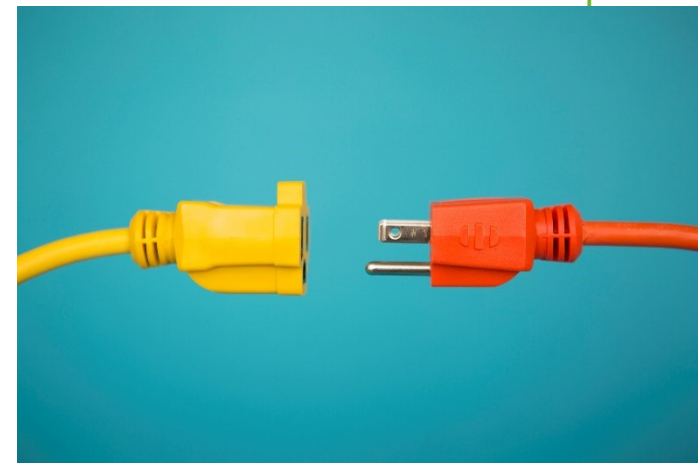
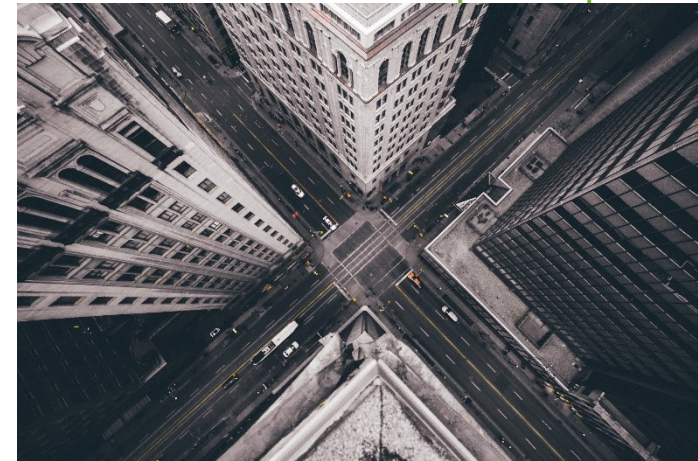


2. OBJECTIVES & SCOPE

Overall objective: Tackle noise pollution from road traffic noise focusing on a future perspective in which electric and hybrid vehicles will be a consistent portion of flow.

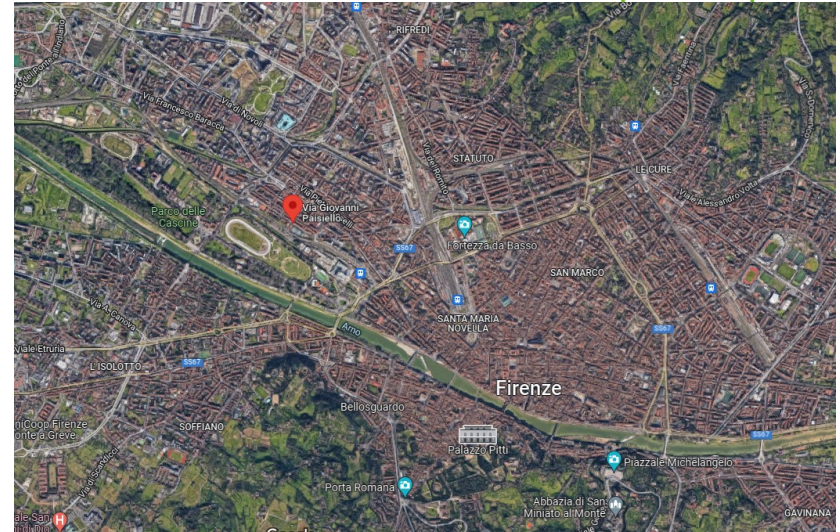
Specific objectives:

- ✓ Combine knowledge of road optimization and tyre development in order to test an optimized solution for reducing noise in urban areas and Life Cycle Cost with respect to actual best;
- ✓ Reduce noise for roads inside very populated urban areas through the implementation of a mitigation measure aimed at optimizing road surfaces and tyres of EV.
- ✓ Adopt the soundscape holistic approach to evaluate the performance of EV vs ICEV in the newly built scenario;
- ✓ Contribute to EU legislation effective implementation (EU Directives 2002/49/EC and 2015/996/EC), providing rolling noise coefficients within the Common Noise Assessment Method (CNOSSOS EU), specifically tuned for Evs.



2. OBJECTIVES & SCOPE

The pilot case: Paisiello street in Florence is a busy road due to traffic toward the city center and a two-way travel street without significant curves. It is characterized by a significant population density of the area, and it is close to public offices (Regional Agency for Environment Protection), to the most relevant park in Florence (Cascine) and to one of the most important intervention of urban requalification (ex Manifattura Tabacchi) with new dwellings, primary school, fashion school (university).



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Results achieved till now



5. RESULTS ACHIEVED TILL NOW

Asphalt design

More than 150 solutions for bituminous mixtures have been analyzed. Then 9 mixtures have been selected according to acoustic response (as built and over time), expected life by referring to mechanistic properties, permeability, friction, satisfactory expected life, ENDt (Estimated Noise Difference Due to Texture) value sufficiently low. Based on additional considerations, 2 mixtures (with and without CR) have been designed for testing in Nantes.

Test in prototypal site in Nantes

3D surface texture, sound absorption, extended surface method, mechanical impedance, other road surface properties (SRT pendula friction tests, MPD measurements, dynamical wet friction test, Wehner and Schulze tests), CPX/CPB measurements carried out.

Tyres design

On going design of new tyres for Evs with optimized performances according to subjective noise, hydroplaning, handling, braking, wear, mechanical traction, rolling resistance. 6 versions tested in Nantes, new variant to be tested in Florence.



5. RESULTS ACHIEVED TILL NOW

Pilot case implementation in Florence

Work in progress...



Post-operam



New asphalt laying (150 m + 150 m) completed in July 2021

5. RESULTS ACHIEVED TILL NOW

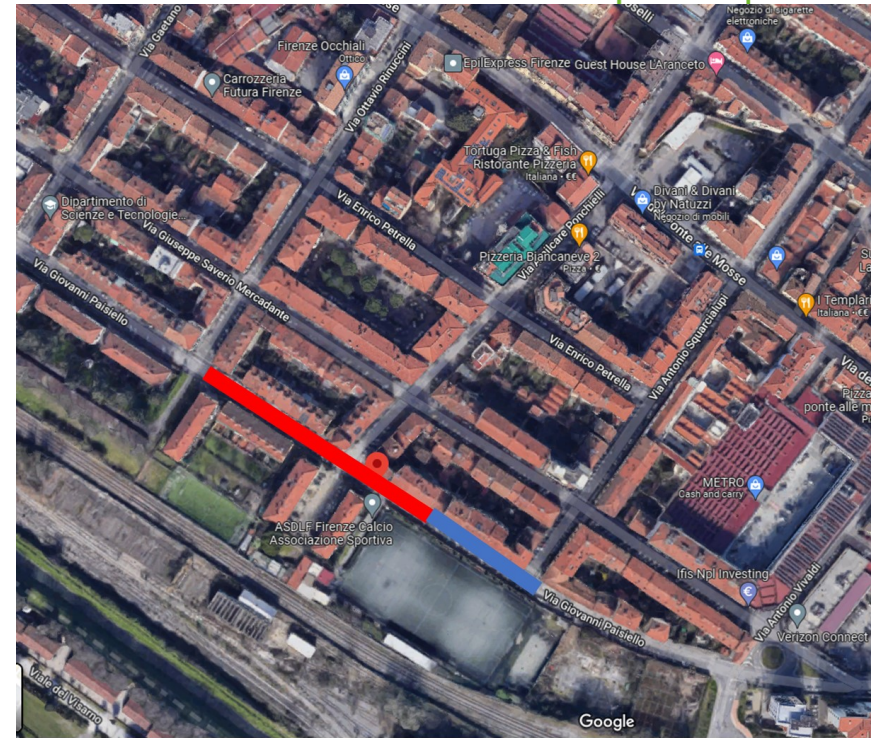
Ante and post-operam measurements

A long-term (2 weeks) ante and post-operam noise and traffic monitoring campaign has been carried out. Significant noise reduction have been verified, especially according to *Lnight* parameter.

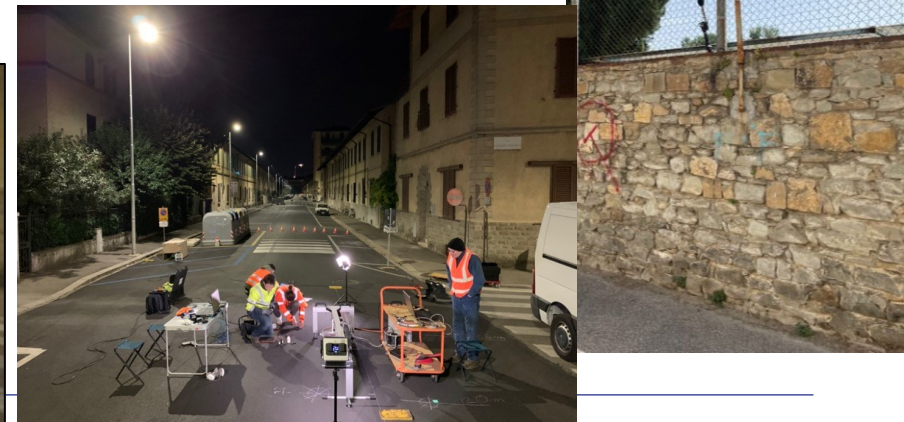
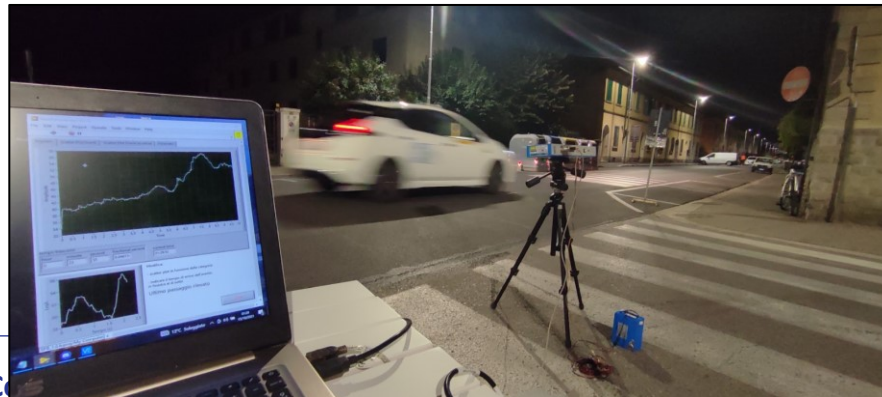
Other carried out measurements:

- 3D texture and dynamic stiffness static
- Extended surface
- Impedance tube
- Impact hammer
- Close Proximity Index
- Controlled Pass By

Obtained results in line with expectations.

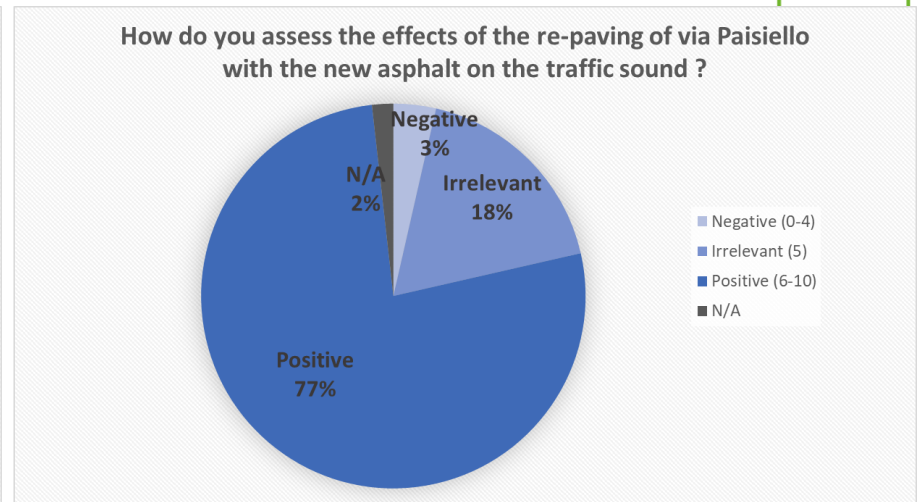
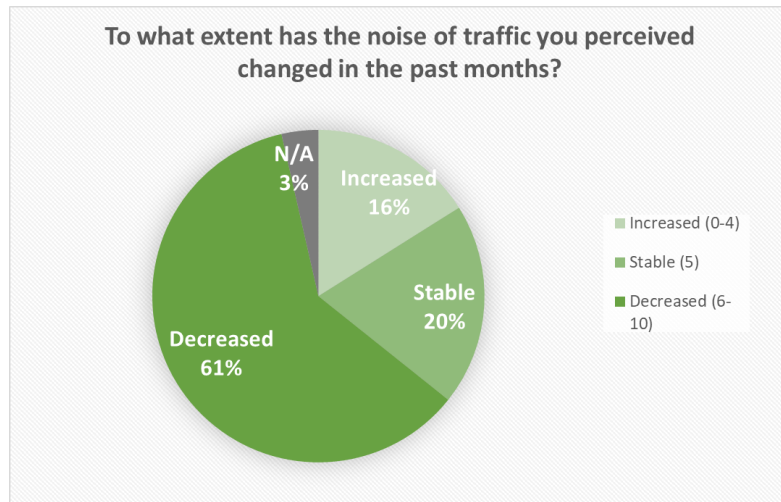


- LIFE E-VIA asphalt
- Standard asphalt

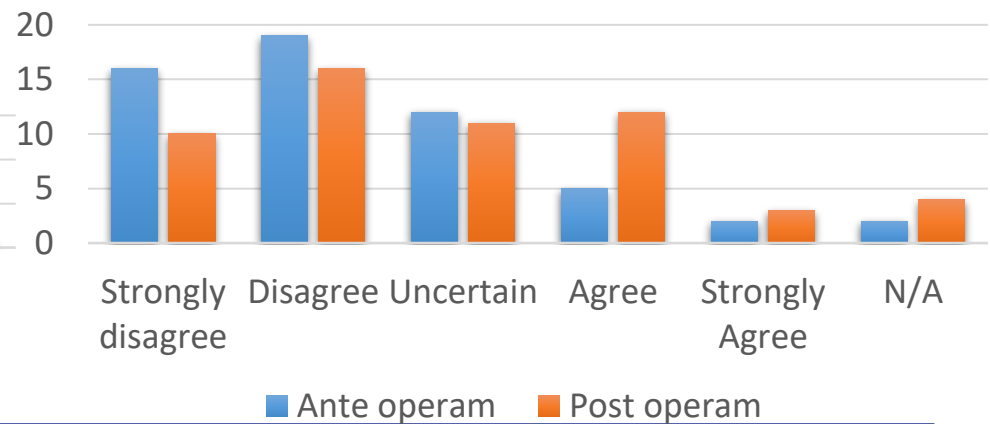
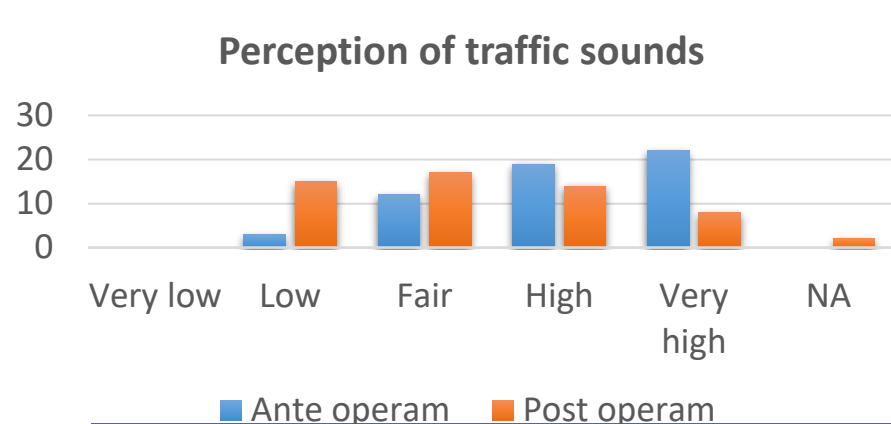


5. RESULTS ACHIEVED TILL NOW

Questionnaires (about 60 questionnaires collected in the ante and post-operam period)



Is the soundscape enjoyable?



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<https://life-evia.eu/>



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Merci pour votre attention