



LOW-NOISE PAVEMENTS

The new proposed solutions for low noise pavements offer significant benefits, including improved mechanical features (elasticity, strength, reduced deformation and thermal cracking, increased durability), flexibility, and adaptability (availability of various technologies to meet different needs), as well as environmental sustainability.

These pavements are not only useful in areas where noise levels slightly exceed the limit but also help reduce the scale and cost of other noise mitigation measures, like noise barriers.



LOW-HEIGHT NOISE BARRIERS (LHNB)

A Low-Height Noise Barrier (LNHB) based on metamaterial technology represents the latest improvement in noise mitigation at the source. Thanks to its advanced panel design, this innovative solution significantly reduces noise pollution without affecting the view of surrounding landscapes and avoiding costly mitigation measures on trains. The LHNB represents a significant step forward in improving the quality of life in densely populated areas.



PILOT SITE

The developed solutions will be implemented in a pilot area located in Rome called La Muratella (an urban area in the XI Municipality with approximately 154,974 residents). This site is crossed by the Rome-Fiumicino Airport railway line managed by RFI and the A91 'Rome-Fiumicino Airport' motorway managed by Anas.

The project is co-funded by the European Union under the **LIFE 2021-2027** Programme for the Environment and Climate Action.



**INNOVATIVE AND ECO-FRIENDLY SOLUTIONS
FOR SILENT INFRASTRUCTURE**



PROJECT'S BUDGET



2,65 million euros

EUROPEAN CO-FUNDING



60% contribution

MAIN GOALS



Enhance the durability of low-noise pavements to reduce costs. By adding functionalized cellulose fibres from waste materials (e.g., textiles and packaging) and crumb rubber from end-of-life tires (ELTs) to the bitumen, durability is expected to increase by 20% and costs reduced by around 14%.



Improve the acoustic, structural, and safety performance of low-height noise barriers (LHNBs) through the design and validation of an innovative, sustainable product. The barrier is shorter than traditional noise reducing devices and is made of crumb rubber, modelled with the metamaterial technology to achieve high acoustic absorption without using fibrous materials (which lack durability). Special attention is given to safety, maintenance, and sustainability aspects of the product, thanks to the use of a high percentage of recycled material (85%).



Define procedures for managing and implementing noise mitigation measures in complex environmental scenarios. An operational methodology will be provided to assist infrastructure managers in coordinating, integrating, and standardizing planned noise mitigation actions to optimize results in both effectiveness and efficiency.

LIFESILENT


The Life Silent project (*Sustainable and Innovative Longlife Environmental Noise Technologies*) aims to explore innovative and eco-friendly solutions to mitigate noise emissions caused by road and railway traffic in complex urban environments.

Life SILENT involves **nine Italian organizations** (Anas, RFI, Italferr, National Research Council, ARPAT - Regional Agency for Environmental Protection of Tuscany, University of Bologna, University of Reggio Calabria, MOPI - Italian Society for Applied Research and New Materials Development, and the TEBAID Consortium - University of Cosenza Consortium for Advanced Biomedical Technologies). It is **coordinated by Anas, a company of the Infrastructure Business Unit of Gruppo FS Italiane (FS Group).**

The project is co-funded by the European Union under the LIFE 2021-2027 *Environment and Climate Action Program*.

Life Silent aims to develop and implement:

 **Low-Noise Pavements** made of eco-friendly, recycled, and non-toxic materials from paper cardboards and end of life tires.

 **Low-Height Noise Barriers** crafted with recycled materials and innovative technology to minimize railway traffic noise emissions.



AN INNOVATIVE PROJECT

Reducing noise requires a holistic approach where different mitigation measures are integrated in synergy to ensure effectiveness and efficiency.

In complex environments with multiple noise sources, such as roads and railways, traditional noise barriers are often unsuitable. Their visual impact and proximity to noise receivers, along with interference with the urban context, make them less desirable. They also hinder the surrounding environment's visibility and airflow, raising local temperatures (especially in summer) and causing residents' discomfort.

For these reasons, the European Commission recommends using noise mitigation measures that directly target the source, like low-noise pavements. However, past trials have proven these methods costly and less effective over time.

With the Life Silent project, solutions at the source are innovatively addressed through the development and implementation of new road pavements and low-height noise barriers.