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KEYNOTE LECTURE:

New perspectives for improving the accuracy of urban noise dynamic maps

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Prof. Gaetano Licitra, BSc and MSc in Physics, Spec. Diploma in Health Physics**,** is currently Director of the Pisa Department of Environmental Protection Agency of Tuscany Region. Habilitated as Associate Professor (2014) and Full Professor (2020) in Applied Physics, he has been teaching Acoustics at the University of Pisa since 1997 in Physics Department and then at the Environmental Sciences Department and from 2024 at University of Malta. He is member of IIAV and member of the board of the Italian Acoustical Association. He has chaired international and national conferences. He is editor of Noise Mapping Journal and Environments.

He is listed among the 2% top scientists by Elsevier and University of Stanford for Acoustics since 2020 and since 2024 also for his career. Professor Licitra's focus is on environmental noise, developing models and measurement techniques to assess noise pollution in urban areas in line with Directive 49/2002/EC. He also explores innovative solutions to mitigate noise exposure.

Professor Licitra's scientific contributions have been widely published in international journals (Scopus H=37, 193 papers indexed and more than 3250 citations). He has played a major role in the development of guidelines, including the WHO Night Noise Guidelines, the EEA Quiet Zone Guidelines, and IEC and ISO standards. These achievements are the result of extensive international collaboration in EU projects such as the V, VI and VII Framework Programmes, Life and Life Plus, Interreg, as well as active participation in working groups such as WHO, EEA, DG Environment, ISO, IEC and concerted actions (ENNAH).

Abstract: Following the adoption of the European Noise Directive, agglomerations in Europe have produced a fourth round of noise maps. Their comparability has been improved by the introduction of the new standard numerical method, CNOSSOS, and its amendments. The development of computer power over the years has reduced the computation time, permitting to move towards dynamic noise maps, but the critical point remains the availability of very good input data, which determines the accuracy of the strategic maps, which are crucial for the assessment of human exposure to noise and the definition of action plans.

The talk will present some recent innovations that can be used to improve this by processing big data, providing traffic data when it is insufficient by AI application to camera images, and using real time traffic models for dynamic noise mapping. A new sensor inside the tires and artificial intelligence applications make it possible to describe the state of the road surface to correct its acoustic emission and prioritize its maintenance.