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Recording-based Auralization of Train Noise in a Digital Urban Sound Planning Toolbox

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Densification around railway stations has the potential to create more climate-neutral transport and resource-efficient travel, but the noise challenge is a limiting factor for sustainable and effective solutions. Currently, railway traffic increases in Europe and major investments in railway infrastructure are planned in Sweden and other European countries. The idea of this project is to finalise a demonstrator of a digital planning tool that facilitates investment in innovative noise measures on or in connection with railway infrastructure close to stations. The digital toolbox will provide the opportunity, at early planning stage, to virtualize the environment for common train types and traffic situations, to describe the effects of planned noise measures including auralization as well as socioeconomic costs and benefits, impact on property values and climate impact. The auralizations developed in this project are based on binaural and ambisonics recordings, which are modified to simulate several measures including rail dampers and various noise barriers such as thin and tall screens and low-height barriers of different widths with acoustically hard or soft surface materials as well as finite lengths. The paper describes the method of auralization, as well as the co-creation and workshop approaches used for the development of the toolbox.

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