

# Effect of vegetation on sound fields in idealised urban open spaces

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## Summary

Noise pollution is a major environmental problem within the EU and during the last years vegetation was examined for its benefits in increasing health and well-being of citizens from different viewpoints, including noise control and soundscape enhancement. This work focuses on numerical simulations to investigate the effectiveness of vegetation for controlling sound fields, especially in terms of the abatement of traffic noise.

Two idealised urban squares were studied, one rectangular and one octagonal. Three plant types, climbing plants (ivy), living green walls with soil substrate and plants in pots (*nephrolepis exaltata*), were used in this investigation, based on their measured properties in laboratory, and four aspects of the use of vegetation were evaluated: effect of the amount of vegetation, effect of changing in the scattering coefficient of vegetation, effect of vegetation in different receiver positions and effect of vegetation on different groups of receivers. Parametric studies on the determination of a line source and on the definition of sound power levels referred to traffic noise were also developed. Three simulation tools were used, namely CATT-Acoustic<sup>®</sup>, CRR (Combined Ray-tracing and Radiosity) and Odeon<sup>®</sup>.

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