Statistical attribution of errors in urban noise modeling

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Due to the great variability of sound levels present in a city, static characterizations based on average values are falling out of favour. A distribution of differences analysis between the measured and calculated sound levels is conducted in this study to evaluate the accuracy of the noise model, and to analyse the different urbanistic and road traffic characteristics that influence their uncertainties. Results show that the noise model underestimates noise values in the road categories with the highest and lowest road traffic flows, specified as categories 1 and 5, respectively. Monitoring of vehicle speed in category 1 and use of an appropriate on-site measurement strategy could improve these estimates. Furthermore, a clear influence was observed of the number and percentage of heavy vehicles in overestimating noise values. Finally, the relationship of uncertainties with urban variables was studied as a possible alternative method of estimation. A multivariate model developed from urban variables recorded in different road categories, except for category 5, captured 70% of the variability of noise model uncertainty. © 2019 Elsevier Ltd

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