

Shaping the level of traffic noise as a function of traffic intensity distribution in terms of the existing and planned system of national roads

Abstract

The paper describes the current guidelines and indicators used for estimating traffic volumes and assesses the differences between forecasted and actual traffic volumes. The results presented in the paper come from the years 2005 - 2022 and include both in situ measurements commissioned by the General Directorate for National Roads and Motorways, GPR measurements, and forecasts made taking into account the elasticity coefficient and GDP. The analyzes were carried out for four selected road sections: the A4 motorway, the S1 expressway, the national DK1 road and the DK44 road. The results of actual measurements were converted into the value of traffic growth of a given category of vehicles, forecast for a specific year on the basis of data from the year of measurements of this intensity. On this basis, a procedure was developed for testing and calculating (simulating) road noise, starting from the measurement and ending with the analysis of the results. All these calculations lead to the creation of acoustic maps based on predicted or measured inputs. As part of the work, the results of measurements in a total of nine reference measurement points and 27 additional measurement points were presented. The results and analyzes obtained led to the estimation of the risk of significant noise disturbances and significant sleep disturbances depending on the estimated and measured traffic volume. Due to this, the impact of the intensity estimation error on the risk of occurrence of the indicated nuisances was assessed. On this basis, the number of people exposed to given nuisances was estimated depending on the number of inhabitants in a specific building, which is exposed to noise resulting from the forecasted or actual traffic volume.

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6.07.2023 r.