

Two-Dimensional Road Traffic Noise Mapping: A Case Study of Matara City in Sri Lanka

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Abstract

Road traffic noise pollution is increasing year by year due to urbanization. Road traffic noise pollution is increasing year by year due to urbanization. Road traffic contributes to 80% of a city's noise pollution. Noise mapping is a comprehensive method for measuring and analyzing environmental noise, including the number of persons who are bothered by it and how often they experience its disruptive effects. This study focuses on visualizing road traffic noise levels in Matara city, Sri Lanka. Traffic noise varies in different factors and a proper noise equation is essential to calculate road traffic noise. The noise observation points' separation and the precision of the noise equation are key factors in determining how well noise is represented visually. The Henk de Kluijver's noise model is used for calculating noise levels in this study. Suitable spatial interpolations are vital to interpolate traffic noise levels. Moreover, this study enhances the accuracy comparison between Inverse Distance Weighted, kriging, and spline spatial interpolations on road traffic noise mapping. Designing noise observation points (Nops) is vital to the accuracy. Therefore, 10 metre distance interval was used for Nops. According to the Root Mean Square Error (RMSE), kriging interpolation had the minimum RMSE value. The final noise visualization was done by kriging spatial interpolation. However, 65.44% area was less than 63dB in the morning, and 64.82% area was less than 63dB in the evening. Urban planners of city development projects can utilize the results of this study in the future.

Keywords: *Noise models, Noise visualization, RMSE, Spatial interpolation*