

# **Prediction of Line-of-Sight Propagation Loss in Inter-Vehicle Communication Environments**

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This paper presents a prediction formula of propagation loss for low height scenarios on a line-of sight (LOS) straight-line road having an intersection, for modeling the propagation loss characteristic in inter-vehicle communications (IVCs). The regression analysis is applied to the propagation loss data generated by computer simulation based on the geometrical optics theory, and the regression formula is established as a dual-slope model having variables of propagation distance, frequency, road width, and antenna height. In this analysis, the position of breakpoint is determined so that the RMS error of the regression becomes the smallest on both slope regions because its position is an important factor for good prediction accuracy. Furthermore, the comparison between predicted and measured propagation losses is performed in 2 GHz and 5 GHz bands, and the effectiveness of the prediction formula is confirmed by evaluating the prediction errors.