

**THE DEVELOPMENT OF MODELS TO DETERMINE THE  
RUNNING SPEED OF MOTORCYCLES AND ANALYZE  
RIDERS' COMPLIANCE TO SPEED LIMIT**



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**ABSTRACT**

This research analyzed riding behaviour of motorcyclists under free flow or near free flow conditions on a highway section in Thailand. Traffic flow data were recorded from roadside by using video cameras and then subsequently analyzed by image processing technique using Autoscope traffic analysis tool. The analysis results showed that on average a motorcyclist traveled at the speed of 71.57 km/h. There was a significant difference of mean motorcycle speeds due to helmet use, lane position, and engine power of motorcycles. Furthermore, the multiple regression model and binary logistic model were estimated to explain the running speed of motorcycles and the likelihood of riders' compliance to speed limit, respectively. Three common variables were significant in both models; namely, distance between sidewalk and the subjected motorcycle, total number of riders and passengers, and engine power. The use of helmet (dummy variable) was also significant in the multiple linear regression. The adjusted R-squared was 50.08%. The accuracy test using 167 testing samples showed mean absolute error (MAE) and mean absolute percentage error (MAPE) of 8.22 km/h and 12.84%, respectively. For binary logistic regression, the receiver operating characteristics (ROC) curve was analyzed for model accuracy. The area under curve (AUC) was 0.925 and the optimal cut off value for the best classification was 0.523. Finally, several policy implications could be derived based on the research findings.

**KEY WORDS: MOTORCYCLE/RIDING BEHAVIOUR/KINEMATIC FEATURE  
RUNNING SPEED/SPEED LIMIT/SAFETY**

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