Evaluation of Criteria for Setting Speed Limits to Sri Lankan Highways (Non-Built-up Areas)

Himaru Kumarage[1], Nadeesh Silva[2], Malika Lakmali Guruge[3] and Vasantha Wickramasinghe[4]

Abstract

Speed limits are posted on roads to enhance the safety of road users. However, no comprehensive norm is adhered in deciding the speed limits in many countries, and Sri Lanka is not an exception. In Sri Lanka, the speed limit is solely decided by the vehicle category and location (i.e., whether the road is located in a built-up area or non-built-up area). No geometric features of the roadway, roadside environment or safety concerns are been considered. Thus, this research is having the aim of investigating the factors to be considered in deciding the speed limits for roads in non-built-up areas. In that context, data were collected in ten locations located in non-built-up areas. At least 300 data samples were obtained from each selected location. Those ten locations were selected based on different geometrical characteristics, roadway environment, vehicle density, accident rates, and road classes. Initially, the ANOVA test was performed to find out whether there exists any difference in 85th percentile speed value between vehicle categories. The intention was to divide the vehicles into similar speed clusters. From that, it was identified that motor-bikes and light vehicles are selected as one cluster while three-wheelers and heavy vehicles as another cluster. Next, to identify the influential factors towards the speed limit of each cluster, correlation matrices were observed. From the results, the speed limit of motor-bikes is highly correlated with the roadside activities, roadway operation (one-way or two-way) and roadway marking. The speed limit for three-wheelers and light vehicles are mainly influenced by lane width, roadway operation (one-way or two-way), roadside activities and road markings. Roadside activities, lane width, roadway operation (one-way or two-way) and bicycle lane width are the factors affecting the speed limit of heavy vehicles. Multiple linear regression models were fitted for each vehicle cluster and validated. Mainly roadside activities, lane width, roadway operation, and road markings are collectively affected in deciding the speed limits. These developed models are useful in review the existing posted speed limits in non-built up areas.

Key Words: *Built-up areas, Speed limits, Traffic speed*

Author Details

1. Undergraduate, Department of Civil Engineering, Sri Lanka Institute of Information Technology (SLIIT), Malabe, himarurk@yahoo.com

2. Undergraduate, Department of Civil Engineering, Sri Lanka Institute of Information Technology (SLIIT), Malabe, nadeeshchameers@gmail.com

3. Lecturer, Mathematics Unit, Faculty of Humanities and Sciences, SLIIT, Malabe, malika.l@sliit.lk

4. Senior Lecturer- Higher Grade, Department of Civil Engineering, Sri Lanka Institute of Information Technology (SLIIT), Malabe, vasantha.w@sliit.lk