PENGEMBANGAN MODEL HUBUNGAN TATA GUNA LAHAN, JARAK SIMPANG SUSUN DAN KINERJA JALAN TOL JAKARTA – CIKAMPEK

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Land use in Jakarta-Cikampek Toll Road Corridor has developed very rapidly. This development grows generation and attraction of traffic which emerges toll road infrastructure problem. Traffic congestion often occurs in toll road especially in Greater Jakarta Metropolitan toll roads and in big city toll roads. There are several reasons which cause traffic congestion in toll roads. One of the indicated reason is interchange spacing. Therefore, it is required to evaluate a proposal of additional interchange. The evaluation should be on land use planning, topographical and geometrical and toll road performance forecasting. This dissertation is a case study research on Jakarta-Cikampek Toll Road.

Land use development along Jakarta-Cikampek Toll Road Corridor from Bekasi until Karawang was investigated. Traffic survey on several ramps and on the main road was conducted. A matrix was established where on/off ramps traffic volume being the dependent variable and land use date being the independent variables. Correlation between on/off ramp traffic volume and land use data was established using multi Tinier regression. Then, with main road traffic volume and speed data, traffic density was calculated using the general formulae: D=V/S whereas D is traffic density; V is traffic volume; and S is speed.

Furthermore, using those data, traffic characteristic model was selected from 4 models i.e.: Green Shield Model, Greenberg Model, Underwood Model, Bell Model. Base on the selected model then specific mathematical formulae between traffic volume, speed and density was established. Relation, between land use and on/off ramp traffic volume as a result from multi linear regression was $Y= 66,895+0.323X_2+12,660X_4+2.061X_5-0,779X_6$ whereas: Y = On Ramp Traffic Volume (pcu/hour); X_2= Number of Family; X_4= Residential Area (hα); X_3= Industrial Area (hα); X_6= Paddies Field Area (hα), $Y= 266,544+54,868X5-1,959X6+1,623X7$ whereas: Y = On Ramp Traffic Volume (pcu/hour); X_2= Number of Family; X_4= Residential Area (hα); X_5= Industrial Area (hα); X_6= Paddies Field Area (hα), X_7= PDRB (Billion Rupiah).

The selected mathematical main road traffic model was Underwood Model. Some nomogram and simulation resulted from this dissertation could be used to answer the relation between interchange spacing and Jakarta-Cikampek Toll Road performance. The regulation about interchange spacing minimum is suggested to be reviewed. Others toll road like city toll road, inter-city toll road and non-Java toll road is recommended to be researched.

Keywords: Land Use, Interchange Spacing, Toll Road Performance