APPLICATION OF GEOGRAPHIC INFORMATION SYSTEM TO EVALUATE THE TRAFFIC DENSITY OF PRIMARY ARTERY ROAD AND SECONDARY ARTERY ROAD IN SURABAYA

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Abstract

The activity of life of Surabaya City has increased, imbalance of vehicle’s growth and provision of road vehicles, causing the traffic density which its peak happened at busy hour. Busy hours is certain time in a busy period, morning and evening, local time. The traffic density often encountered in primary arterial roads and secondary arterial road of the city. In these condition, the vehicle’s speed decrease so that the level of quality road’s services become worse. Considering fund limitation for the development of road’s facilities/infrastructure and constraint of physical on geological aspect artery road, hence to overcome the issues, it is needed an alternative technology named information system computer-based. Information system computer based is Geographic Information System that provides an overview of Traffic Density by giving attention to Degree of Saturation (DS).

In this research, the spatial data used is topographic map of Surabaya in 1999, the scale 1:25.000 and non spatial data including tabular data of road's capacity and also volume of vehicles on primary arterial road and secondary arterial road of Surabaya. Busy hours which is used starting at 06.00-09.00 A.M and 4.00-7.00 P.M due to the guide-book "Survey Kinerja Lalu Lintas Kota Surabaya 2010" obtained from Dinas Perhubungan Surabaya indicates the time which have the highest traffic volume among 05.00 A.M - 09.00 P.M . DS is calculated from quotient
between total volume of vehicles every hour (Q) with the road's capacity (C). DS’s value will be grouped into three levels of density, first level of DS 0 – 0,5 is lowest density, level DS 0,51 – 1 is higher density, and level DS>1 is the highest density. SIG is used to visualizing the result from alternative road which could probably be passed by vehicles.

Results from this research indicate’s that the highest Degree of Saturation (DS) occured at 07.00-08.00 A.M on Wonokromo Street with DS 1,775, the lowest Degree of Saturation occured at 06.00-07.00 A.M on Tanjung Perak's Street with DS 0,154. From GIS applications and time which has been determined according to busy hours, obtained normal path where the traffic’s density ignores, blocking path due to the huge degree of saturation (DS) on that street, and the alternative path in which this path indicated the highway to avoid the traffic jams when the peak of degree of saturation.

Keyword : GIS, Traffic Density, Degree Of Saturation, Surabaya