Micro simulation model to analyze turning movement delays at road intersections

L W G Liyanage[1*] and J M S J Bandara[2]

[1] *Department of Civil Engineering, University of Moratuwa, Moratuwa*

[2] *Department of Civil Engineering, University of Moratuwa, Moratuwa*

Today the transportation planning process is changing from unlimited expansion of infrastructure to improving the efficiency of the existing systems. This requires efficient traffic management tools. Due to the complexity of traffic problems, many of these tools are computer-based models, a development that is reinforced by the explosion of computational power over the recent past.

This paper presents a methodology of development of a micro simulation model to estimate delays at road intersections. This would give an opportunity to traffic engineers to evaluate the need and effectiveness of traffic control measures before implementation. This information is very useful for situations where traffic signals are to be installed and the field trials would be expensive.

Three variables that have considerable impact on intersection performance were selected for modeling. The selected variables are geometric properties of the intersection, vehicle properties, and driver behaviors. The model is capable of handling twelve different lane arrangements, five vehicle types and three driver behavior situations are handled by the model and have the flexibility of changing the required variations.

Model out put include queue length, vehicle flow, vehicle delay of each approach and graphical representation of vehicle movements. Filed verifications have shown that the simulation model results are not significantly different from the observed delays. It is also shown that the analytical models tend to under estimate the delays at intersections. This is mainly due to the inability of analytical models to accommodate random nature of the traffic flow.

* gayam@civil.mrt.ac.lk Tel: 011 2650567