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MICRO SIMULATION MODEL TO ANALYZE TURNING MOVEMENT DELAYS AT ROAD INTERSECTIONS

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This thesis was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfilment of the requirement for the Degree of Master of Science.

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DECLARATION

The work included in this thesis in part or whole has not been submitted for any other academic qualification at any institution.

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L.W.Gayan Liyanage

UOM Verified Signature

Prof. J.M.S.J.Bandara

To My Father and Mother

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Abstract

In many countries the transportation planning process is currently turning from the unlimited expansion of the infrastructure to the improvement of the efficiency of the existing systems. This demands the development of efficient management tools. Due to the complexity of the problem, many of these tools are computer based models, a development which is reinforced by the explosion of computational power over the recent past.

This research is a development of a micro simulation model to understand delays at intersections. This would give an opportunity to traffic engineers to understand delays at intersections and to evaluate the 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.

Even though there are a large number of variables that contribute to the intersection, three variables that would have considerable impact on intersection performance were selected for modelling. They are Geometric Properties, Vehicle Properties, and Driver Behaviour. Three different lane arrangements, five vehicle types and three driver behaviour situations can be handled by the model.

This model can be used to simulate both controlled and uncontrolled situations of four-way or three-way intersections. Validation of the model with field data was done using field surveys. Model outputs include queue length, vehicle flow, vehicle delay of each approach and graphical representation of vehicle movements.

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