POTENTIAL OF GIS FOR INTEGRATED HIGHWAY MANAGEMENT SYSTEM

by

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Research work supervised

by

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DECLARATION

I, S.A Silva hereby declare that the content of this thesis is the output of original research work carried out over a period of 15 months at the Department of Civil Engineering, University of Moratuwa, Sri Lanka. Whenever others' work is included in this thesis, it is appropriately acknowledged as a reference.

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DEDICATION

To My Dear

Father, Mother, Brother and my sister

ABSTRACT

Roads are backbone of transportation system in most countries. It is identified that inefficient road planning and management not only wastes vehicle energy but also valuable time of people. Heavy traffic congestion, environmental pollution and unsafe roads are among the most serious problems caused by inefficient highway management. Hence, roads have become crucial part of economic development of a country at present.

In recent years, Sri Lanka also has experienced a very high growth rate in urban population and the number of private vehicles. Most evident feature of such a trend is urban road congestion. Hence, roads in rural areas also facing unexpectedly high traffic flow which causes a lot of time waste in transit and huge losses to the economy of the country. Therefore, the efficient route planning and management has also become one of an important study area because government has identified that build new roads is not the only solution for this problem.

Efficient highway management mainly depends on two tasks, which are efficiency of highway data management and reliability of analysis done using that data. Therefore, it is important to have a model (i.e. system, tool) which can be used to perform above tasks. Therefore, in this study, it is attempted that to develop a GIS based model which is called as “Integrated Highway Management System” (IHMS) by customizing the ArcGIS software using Visual Basic (VB 6.0) which helps to engineers and planners to carry out their planning and management an efficient manner.

The model is capable of manage road inventory data, manage accident data and emission data, find shortest path and alternative, estimate the emission level of divisional secretariat divisions and estimate the traffic flows of road links using available origin destination data. Moreover, it is carried out detailed literature review about ArcGIS customization to develop the IHMS.

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S.A. Silva

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