

**EVALUATION AND IMPROVEMENT OF TOLL
COLLECTION SYSTEM IN SRILANKAN
EXPRESSWAYS
CASE STUDY FOR COLOMBO-KATUNAYAKE EXPRESSWAY**

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Degree of Master of Engineering

Department of Civil Engineering

University of Moratuwa

Moratuwa

Sri Lanka

July 2018

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Thesis submitted in partial fulfilment of the requirements for the degree

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

With the latest development, three Expressways were opened for public in Sri Lanka and it is expected that the number of riders for expressway network will rise. The pay toll system in road is based on the traditional method which is collecting the toll by road barriers installed at the entrance & exit points of Expressways. Although in this system the toll is collected directly from the drivers, the existence of barriers causes increased travel time, increased fuel consumption and consequently increased pollution in the road environment. For a more continuous flow of traffic, an Electronic Toll Collection (ETC) system was introduced in Colombo – Katunayake Expressway (CKE) since June 2015 to help alleviate traffic congestions; reduce environmental pollution, reduced cash circulation, integration of the financial system, more passenger comfort, reduce the service time specifically at Toll Plazas.

This research focuses on the economic and technical analysis of existing toll collection systems in Colombo-Katunayake Expressway. The study is aim to evaluate the newly established ETC Toll collection System CKE.

In detail, the objective is to assess the amount of delay of the individual lanes of dedicated for MTC and ETC; their service time, lane capacities and the forming of queue in each lane and compare with the different modes of toll systems used in other countries. The study also aims to find out the specific factors that affect the delays experienced at Toll plazas & decrease the system performance and proposed suitable, recommend ways to improve the service. Not only that the study is focused on the evaluation of economic loss due to the delays in toll lanes and level of lane utilization by each mode of vehicles. The analysis of the current toll systems in CKE under the system, financial, traffic, environmental, infrastructure and socio-economic aspects would be conducted using SWOT analysis.

Then, the different toll collection methods & technologies are studied under this research and compared characteristics, performances of each individual technology. Analysis is done for identify the appropriate ETC toll collection method. Further, fuzzy logic based MADM (Multiple Attribute Decision Making) approach is employed for selection of optimal ETC system for Sri Lankan Expressways.

Consequently, short-term and long-term recommendations for Sri Lankan road tolling system are proposed in terms of transportation.

DEDICATION

To

My Loving Parents and Wife

Who Always Encouraged Me towards Success

ACKNOWLEDGEMENT

During preceding the research work I was lucky to associate everyone who helped us with advices and encouragements in so many ways to make this research a success. I would like to acknowledge many people who supported me to complete the master's research successfully. First of all I would like to extend sincere gratitude to project supervisor Dr. G.L.D.I.De Silva, for suggesting this research topic, which gave me the opportunity to explore many areas and giving guidance and helpful information to complete the research. Further for providing opportunity to attend conferences workshop for knowledge enhancement and reviewing the papers admits his busy schedule.

This research outputs would not have been possible if it wasn't for the comments and suggestion from academic and professional experts in respective fields. Therefore I would like to thank the following personnel for giving their time and expertise to the successful output of this research.

This gratitude extends to Prof. J.M.S.J. Bandara, Prof. W.K. Mampearachchi & Dr. H.R. Pasindu for their advices, guidance and their support in this study. Further I like to thank Ms.Melani Jayakodi, Course Assistant for her support in all official matters throughout this study and my colleagues in Highway and Traffic engineering Course for their continuous support and comments given to successful completion of the research.

Last but not least I would like to thank my parents and my wife for their unending support throughout my journey. Without them I wouldn't be able to accomplish any of the achievements that I have attained so far.

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