

A Study on electronic toll collection systems in expressways in Sri Lanka

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Abstract— This paper focuses on the determinants that affects, when introducing prepaid and postpaid Electronic Toll Collection systems to Sri Lankan expressways. Purpose of this research is to identify the user preference between prepaid and postpaid Electronic Toll Collection methods and to identify the determinants that affect such a choice. The study is focusing on analyzing the new implementation of Electronic Toll Collection in Sri Lanka, hence the drawbacks of the current cash based tolling system is identified. At the moment cash is the only available option for the expressway users. With the rapid growth of the traffic density, even the expressways are eventually getting congested especially near the toll gates. As a result, Sri Lankan government is on the process of introducing electronic payment mechanisms in very near future but only one prepaid payment option been considered under their new implementation plans where the users do not have a liberty to make a choice, which is of little benefit. Therefore to check the user preference on electronic toll collection methods, five widely implemented methods been considered which were subsequently divided into two, prepaid and postpaid. Based on the literature, a structured questionnaire survey and interviews were carried out in order to collect primary data. 230 responds were able to collect within the months of November and December 2014 which were used to test the significance of the identified variables using Person's chi squared statistics and binary logistic regression analysis. Secondary data has been collected using literature and previously published reports from RDA, National Transport Commission, Ministry of Transport and The Central Bank. Based on the results it was concluded that only the convenience and vehicle category have a significant association with the dependent variable of Prepaid or postpaid ETC method while combined effect of convenience and vehicle category too have a significant relationship to the dependent variable.

Keywords— electronic toll collection; srilankan expressways; prepaid and postpaid payments; user preference.

I. INTRODUCTION

For a country, transportation is the web that links people, cultures, cities, towns and villages in to a one common

network of relationships. People use transport services to commute from one place to another and fulfil their day to day necessities. Transportation distributes varied resources to every nook and corner of the country which are originally concentrated in to a one place. In early ages, people used non motorized transportation modes for their activities and eventually it was rapidly developed subsequent to the industrial revolution utilizing the new technologies. At present, technology has become an integral part of the transportation and people tend to demand much more complex facilities for their transport related activities.

Out of the various means of local transportation options which are in existence, road transportation is one of the highlighted areas of modern development plans in the country. Road transportation counts for more than 90% of the land transport in the island and covers more than 12,000 km of A and B class roads within the country. After the end of the long prevailed civil war in the country, opportunities has enlarged to the public and people tend to enjoy the benefits derived out of those opportunities. Hence the commuting patterns of the population have changed drastically and there was a rapid increase in traffic volumes during the past few years but, there had been a shortage of capacity to meet this demand. As per the sources of Departments of Motor Traffic, during last few years overall vehicle population shows a growth rate of about 56% while in year 2010 total number of vehicle registrations increased by 76%. From the preliminary studies carried out to meet this demand, it has been realized that rehabilitation and widening of existing roads to cope up with future traffic needs at a meaningful level of service is a difficult task without large scale acquisition and demolition of buildings and relocating service utilities. Therefore with the intention of developing and upgrading the road transportation systems, Sri Lankan government has expedited the major proposal to construct expressways for its road network.

Expressway is a novel concept to Sri Lanka which was only initiated in few years back. For the moment, over 150 kms of designated expressways are serving the southern part of the country. It travels from Kottawa to