Development of Performance Indicators to Evaluate Performance-Based Road Maintenance Contracts

G.L. Mullevithana [1] and J.M.S.J. Bandara[2]

Abstract

Effective maintenance is essential to achieving sustainable development in Road sector. There are categories of maintenance activities as per the time of attendance, the period of attendance and frequency of attendance. Period for relevant activities is not specific. It is varying with the site condition and various parameters. Build- up the relationship between parameters helps to deliver the tangible results to programming, scheduling and budgeting for good governance, accountability and transparency in performance base maintenance.

Road maintenance activities can be classified as per nature of attending; Routine, Recurrent, Periodic and urgent. Indicators of Road Surfacing and Road Marking on the paved road under periodic maintenance were selected to monitor and evaluation in this study. These activities are required to attend at periods of several years, the frequency depending on the damage caused by traffic and other factors. International Roughness Index (IRI) of road surface data was collected by the existing RDA database and Roadroid Mobile App with comparing last improvement details on selected road segments. Data for thickness, skid resistance and reflectivity of road marking were collected by the field test with following the tools of monitoring and evaluation (M & E) which can be used to improve the way achieving better result.

Collected data were analyzed using panel regression, multiple regression and logistic regression tools. Initially stationary of data that represent variance and autocorrelation structure do not change over time was tested according to the Hadri Z statistic and results are significant providing selected stationary data. Out of random and fixed effect models, the most appropriate model is recommended by the Hausman test and that is the random effect model. According to this model, IRI gradually goes up due to Annual Average Daily Traffic (AADT) and within the periods, IRI will come to the critical level where the roads must be paid attention for the development. The range needs to be provided for periodically with achieving a critical range of IRI using selected stationary data models. Relationship between thickness, skid resistance & reflectivity of road marking with ageing is to be built up for future implementation and continue appropriate maintenance strategies.

Keywords: *IRI, AADT, Thickness, Skid Resistance, Reflectivity, Panel regression, Multiple Regression, Logistic regression*

Author Details

1. Postgraduate Student, Transportation Engineering Division, Department of Civil Engineering, gayaniapm@gmail.com
2. Senior Professor, Department of Civil Engineering, University of Moratuwa, samanjbandara@gmail.com