

Evaluation of Cost Effectiveness of Performance Based Maintenance Contract

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Road authorities around the world have been innovating and finding ways to cope with the high cost of road network maintenance, the growing demands of road users and the changing traffic type and volume. A well maintained road is needed to make the network sustainable for future generation.

Poorly maintained roads constrain mobility, increase vehicle operating cost, increase accident rates and their associated human and property cost. Poor maintenance of the imposes heavy burden on the economy. However maintenance allocation for road agencies has steadily increased. There is a need of providing better value for expenditure, through higher level of service and low total maintenance cost.

The objective of the study is evaluating the cost effectiveness of performance base maintenance contract especially provincial roads in Sri Lanka.

Four types of maintenance methods were analyzed. Maintenance cost and condition of the road in each category were analyzed. It was found that Performance Based maintenance contract method performed well low cost and good road condition. The road condition is maintained at good condition relative to the other method with low maintenance cost. And it was also founded that developed formula can be used for the road condition, when the overall damage percentages of the distress are given.

Road maintenance consist of several items such as maintaining of road carriageway (pavement), shoulders, draining stems, road signs & markings within the right of way. The research was focused on establishing a road condition rating index based on the road condition and analyzing the effectiveness of the maintenance standard, there are several types of Maintenance contracts, namely; Direct Labor, Contract, Performance based Contract and Performance based direct labour. Effectiveness of Maintenance standard in four contract method was analyzed using the road condition rating index and the maintenance cost.

It was found in the literature that most of the countries use International Roughness Index (IRI) to evaluate the pavement condition and the standards have been based on the IRI value. However, provincial road development authorities in Sri Lanka are still not using IRI to select road for maintenance or rehabilitation. The selection of roads for maintenance is done arbitrary. Survey was conducted to find the maintenance standard used in provincial road development authorities. Currently, Western Provincial Road Development Authority maintains the roads under different maintenance standard. Performance Based Maintenance (PBM) standards have been introduced recently for the Western Province Roads network especially for foreign funded projects to evaluate their performance. In this research, pavement distress data were collected of selected road sections and the pavement rating of the selected roads by a panel consists of Engineers, technical officers and Technicians. The Collected data was analyzed using SPSS software. It was found that the r-squared value of the selected independent variables for the relationship was about 0.36 with the shoulder damaged, Since the shoulder damage has minimal effect for the condition of the carriageway, it was removed from the

independent variables and R-Squared value of the relationship has been increased to 0.726 and the analyzed showed the significance of the selected parameters.

Cost of the conventional maintenance methods are higher cost than the performance based method. It was shown that the rating of the road condition in performance based contract system is higher than the conventional methods used in this analysis. It is clear that, cost saving can be achieved under the performance based contracts.

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