

Thitirat Chirathitiporn 2010: Evaluation of Highway Maintenance Cost Estimation Methods by AHP. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Varameth Vichiensan, Ph.D. 151 pages.

This study reviews the highway maintenance cost estimation procedures in reference with the guideline announced by The Comptroller General's Department as well as the practical procedure within the Department of Highways. This Results in a set of standardized procedures for estimating the cost of each of hundred work items. Secondary, this study evaluates the three cost estimation candidate procedure namely, the manual procedure following the guidelines, the customized MS-Excel program, and the recently developed system call Highway Budgeting Program. The evaluated is based on the Analytical Hierarchy Process (AHP), in which the determining factors are organized in different their and pair-wise comparison is conducted for each pair of factors. The case study is conducted on selecting the most appropriate estimation procedure among the three candidates for the asphaltic surface highway maintenance. The factors include time-saving, accountability, flexibility, accuracy and plausible errors. Detail interview to seven experts in highway maintenance is conducted.

The case study reveals that the cost estimation procedure is not consistent over the country, which is resulted from the locally adjusted procedure to meet their own needs based mainly on experience despite of the existence of the common guideline. This study has shown that the newly developed Highway Budgeting Program could estimate the cost accurately and satisfactorily. Evaluating by AHP suggested that accuracy is the most important factor taking 43.6% while the plausible error 25%, flexibility 15.9%, accountability 7.9% and 7.7% for time-saving respectively. Based on these determining factors, AHP ranks (summed to 100%) the candidate procedures as follows: customized Excel program 44.4%, the Highway Budgeting Program 42.3% and manual one 13.3%. The study has concluded with the findings to improve the highway maintenance cost estimation procedure, which could be adapted to the other construction cost activity as well.

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Thesis Advisor's signature