

■ 博士學位論文紹介 ■

논 문 제 목 : 계층분석법을 이용한 교통투자사업 대안 평가
 (Analytic Hierarchy Approach for Transport Project Appraisal
 -An Application to Korea-)

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Transport evaluation methodology in Korea has remained largely unchanged even though the evolution of the transport planning process has changed in its nature and circumstances. The economic analysis has played an important role as a decision-making method, and the Government has the leading role as a single decision maker. As a result, there are so many debates on most of transport investment projects by other interest groups and by the fact that other non-economic attributes are not properly considered in the evaluation process.

Therefore, it is necessary to avoid this costly indecision and incomplete evaluation. As a result, the recent work has focused on improving public participation and evaluation methods using multiple criteria decision making methods which are able to reflect diverse interests of multiple actors involved in the project, environmental issues, socio-economic concerns and public discontent in evaluation process, and to respond to the changed nature of transport planning.

In this research, the analytic hierarchy approach which enables to combine the advantages in quantifying the tangible factors from CBA and in

deriving weights of the factors from the AHP was attempted to evaluate the transport investment project in Korea as the methodology through reviewing and assessing many multiple criteria decision making methods.

The case for application was chosen from the real project implemented by Korean Government so as to compare the current evaluation method with the analytic hierarchy approach, one of multiple criteria decision making methods. The project is to develop a high speed rail network passing through/by a historic city with many cultural assets, so there are many conflicting debates between transport efficiency and cultural conservation among the stakeholders affected by this project, supplier, user and community.

For the application and evaluation of the project, a model with five levels of hierarchical structure with three stakeholders, six objectives, seven elements and three alternatives was developed. A total of 615 respondents from transport experts, government officials and the general public answered the survey questionnaire to find out the degree of importance for each stakeholder's role on this project investment from transport

experts, and a relative preference for each attribute as main factor from all stakeholders.

With the evaluation process and results (including alternative ranking) from both methods, they were compared with each other. In addition to this, the applicability of the analytic hierarchy approach method for the evaluation of transport investment project in Korea were assessed by several assessment criteria.

The analytic hierarchy approach provided much wider scope than the current evaluation method through its application. It showed a systematic framework for the evaluation in which all possible factors should be judged with the distribution of weights on all stakeholders incorporating qualitative and quantitative information. In addition, it showed the applicability of the analytic hierarchy approach to the transport project due to its ability to deal with complex problems with conflicting attributes and to elicit the preferences of many stakeholders

affected by the project into the evaluation process. However, it also showed some drawbacks to be overcome such as a large amount of data and information requirement, inherent difficulty in survey implementation, difficulty in structuring a hierarchy, especially in checking the homogeneity.

Main Contents

- Transport Appraisal Methods
 - CBA Financial Analysis, Cost Effectiveness Analysis
 - Multiple Criteria Decision Making Methods
Goals-Achievement Method, Multi-Attribute Utility Theory, Outranking Method, Simple Weighting Method, Analytic Hierarchy Approach
- Comparison and Selection of a method
- Analytic Hierarchy Process
- Model Development for Application
- Model Implementation and Analysis
- Sensitivity Analysis & Comparison