Evaluation Techniques

A decision-maker involved in transportation infrastructure has a range of techniques at his/her disposal to choose a rational investment alternative by weighing up the advantages (benefits) and disadvantages (costs) of a policy action. The ways in which these advantages and disadvantages are weighed and compared vary according to the type of economic evaluation to be used.

The following methods of economic evaluation are used most frequently:

- **Cost-benefit analysis (CBA)**
  The Cost-benefit analysis is a systematic evaluation of a set of investment alternatives which enables to choose the option which maximizes the benefit minus cost or with the highest benefit/cost ratio. CBA values each incremental benefit and costs of each option. To perform this analysis it is necessary to monetise all relevant impacts, such as travel time savings, crash damages and environmental impacts. All future benefits and costs are then converted to their present value to make the comparisons. The discount rate, the rate used to do this, plays a critical role.

- **Multi-criteria analysis (MCA)**
  Multi-criteria analysis takes into account both the effects that are valued in monetary terms and other effects reflecting the objectives of the transport infrastructure investment programme. In the MCA the criteria can be assessed in a number of ways, such as a measured quantity, qualitative assessment or rating. The MCA approach applies weights to

different effects, usually with a large degree of subjective assessment. This method is particularly useful for projects or policies with multiple objectives.

- **Cost-Effectiveness analysis (CEA)**
  Cost effectiveness analysis is useful in cases where the benefits are not easily measured in monetary terms or where they cannot be measured. In this approach, the costs of achieving a specific objective are measured, while benefits are held constant. The lowest cost option for achieving an objective is considered most cost effective. Although CEA may have a significant role to play in decision making, it does not indicate whether a policy is worthwhile or not. However, if a decision is already made to invest in a project, CEA is an important procedure for ensuring the rational use of limited resources.

Most governments or multilateral development banks use one or a combination of these techniques, depending on the scope and/or objective of the investment. Lately, these methods have been used in a complementary manner in order to improve the evaluation quality. Recently, many researchers and practitioners are suggesting extending or transforming abovementioned standard methods of evaluation to take

into account wider economic benefits of transport infrastructure investments.

Due to the growing importance of multimodal planning, many advanced economies are developing Multi Modal Appraisal (MMA) guidelines. With some adaptation, these assessment models can be successfully applied in developing and transition countries as well.

Key Documents:

- Aldian, A., Taylor, M. A. P., A consistent method to determine flexible criteria weights for multicriteria transport project evaluation in developing countries, Transport System Centre, School of Geo-informatics, Planning and Building, University of South Australia, 2005.
  The main challenge of multi-criteria analysis application is how to determine criteria weights applied by the decision maker. This paper introduces a multi-criteria analysis method, called proportion method that is suitable to be applied in developing countries.
- Recommendations for users in the application of Multi-Modal appraisal systems, The World Road Association (PIARC), in French and English, 2009.
  PIARC has researched multimodal appraisal, to publish recommendations for users. These recommendations, as set out in this report, reflect the different needs of developed countries, countries in transition and developing countries.
- Vickerman, R., Recent Evolution of Research into the Wider Economic Benefits of Transport Infrastructure Investments. OECD and International Transport Forum, 2007.
  Recently, there has been debate on whether there are wider economic benefits from transport infrastructure investments. The main aim of this paper is to bring together the various alternative methodological approaches to this problem.
- Mackie, P. J., **A Set of Guidelines for Socio-economic Cost Benefit Analysis of Transport Infrastructure Project Appraisal**, United Nations Economic Commission for Europe, 2003.
  These Guidelines are intended to provide guidance, primarily but not only to CIS member countries, for the selection and appraisal of project proposals. The main goal of the report is to establish a basis for common appraisal methods. It outlines a step-by-step assessment procedure of wider economic impacts.

Presentations:

- Torchinsky R., Transport Project Assessment, Simon Fraser University, Canada, 2008

Recommended Links:

- Minnesota Department of Transportation

For further information
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