

Summary:

Cost benefit analysis of public transport - Overview

The Public Roads Administration , The Norwegian National Rail Administration and The Contact Committee for the Organs in Charge of Transport in the Counties have cooperated to develop common guide lines for cost benefit analysis of public transport measures. The present report is a condensed version of the report presenting the guidelines. It aims to give a first overview of the problems encountered in such analysis and how we normally go about to solve them. The guidelines themselves are found in TØI report 474a/2000. TØI report 474b/2000 is a separate volume of worked-out examples. .

The guidelines are meant to cover not only infrastructure measures, but also management measures, pricing measures etc. Consequently, public transport measures as we define them are a very broad concept, and includes everything that could shift traffic from car to public modes or improve public transport. Not all public transport measures in this broad definition can be appraised with the standardised method of the guidelines. Those who can, are the measures that immediately changes generalised travel costs in one or more travel markets, while those who shift demand for other reasons, cannot.

Based on a first assessment of how wide-ranging the effects of the public transport measure might be, a geographical study area must be defined. The study area is subdivided into zones. Travel markets are defined as markets for trips from one zone to another by a certain mode and in a certain period (day, time-of-day). The generalised travel costs in these markets are preferably determined on the basis of network representations of the transport systems. OD-matrices for each mode and each time-of-day are estimated to find the "do nothing" number of trips in all travel markets in a certain prediction year. The number of trips with the public transport measure is then calculated, based on a chosen demand model. The guidelines contain a systematic procedure to select the appropriate demand model. Equilibrium between supply and demand in all travel markets in all alternatives must be ascertained. This is achieved if the generalised costs as given by the cost matrices are those that produce the demand of the OD-matrices, and the demand as given by the OD-matrices produces the generalised costs of the cost matrices.

Based on a transport analysis of this kind, cost and benefit elements of the prediction year can be calculated. They are user benefits, the net results of the public transport operators and other operators, the financial results of the public transport organs and government, and accident and environmental costs. The rule of a half is used for user benefit calculation, except where a more exact formula is

The report can be ordered from:

Institute of Transport Economics, PO Box 6110 Etterstad, N-0602 Oslo, Norway

Telephone: +47 22 57 38 00 Telefax: +47 22 57 02 90

necessary. Especially if entirely new markets are introduced, the rule of a half should be avoided. On the other hand, it provides a simple way to incorporate an exogenously given rate of the traffic growth into the calculations.

When yearly net benefits are calculated for each of the years where something essential happens to the transport system, the final stage of the calculations consists of calculating the net presents values of cost and benefits for the period of analysis as a whole.

We have sought to incorporate the recommendations of a government appointed Norwegian committee on cost benefit analysis, *Kostnadsberegningutvalget*, regarding the handling of uncertainty and risk. This we do through a special form of sensitivity analysis, where we try to assess the profitability of the project in high growth and recession conditions, respectively. From this, the systematic risk of the project can be assessed. Preferably, we would like to use a low discount rate (a low risk premium) for projects of low systematic risk and vice versa. However, for the moment the discount rate is set to 7% for all projects by governmental decree.

We also recommend that a somewhat higher benefit/cost ratio should be required for projects with a high degree of irreversibility. If some new information may become available at a future date, regardless of whether the project is implemented now or not, we recommend to do calculations of whether it pays to postpone the project or not.

Regarding the presentation of results, we recommend a table showing, among other things, the financial results of the operators and the various organs of government, and that gives a broad overview of who gains and who loses from the project. Connected to this, we treat the shadow price of public funds. We use a shadow price of public funds of 0.20, as recommended by *Kostnadsberegningutvalget*. Costs and benefits of each class of agents are entered inclusive taxes, and the real social cost of resources used up in the project are obtained through entering most taxes as revenue in the column of the government.

The guidelines emphasise clear, complete and sober documentation of the results, and try to create an understanding of the role of cost benefit analysis in the whole of the democratic decision process.

The guidelines are mainly aimed at simple analysis of small measures in simple transport systems, although the principles are applicable to all multimodal cost benefit analysis.