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Summary:

Cost benefit analyses in the Norwegian aviation sector

Introduction

This report is a reference manual for *how* and *when* cost benefit analyses (CBA) should be carried out within the Norwegian Civil Aviation Authorities' (NCAA) jurisdiction. The reference manual consists of two parts. The first part is the manual, containing CBA theory, the methodology and the various factor prices to be used in the analyses. The second part contains four examples on how the methodoly can be used in practice. The examples reflect typical projects within the NCAAs jurisdiction. The manual is designed with regard to compatibility with similar manuals used in other parts of the Norwegian transport sector.

Cost-benefit analysis and decision-making

NCAA is an enterprise owned by the Ministry of Transport and Communications. NCAA has responsibility for management and operation of the Norwegian aviation system, which comprises 26 short take-off and landing (STOL) airports and 15 full length runway airports. The NCAA gets revenues mainly from aviation charges and commercial services at the airports. These revenues define the activity level regarding investments and operations. NCAA does not receive any subsidies.

The transport sector is to a considerable extent subject to political control. The aviation sector is an important part of the transport sector at large. The aviation sector in Norway holds a somewhat exceptional position in the provision of public services because the NCAA is organised as a public enterprise carrying financial responsibility, and with investment programs hitherto based on financial analyses. However, the aviation sector's position in the formulation of the overall transport policy calls for investment analysis with a wider scope to cater for comparability with other parts of the transport sector and to cover external effects. This calls for methods to identify and quantify intangibles as an integrated part of the economic analysis. Such effects are e.g. changes in the use of travel time, accident rates, noise and emissions.

Costs-benefit analysis in the aviation sector is carried out for mainly two reasons:

1. To provide a basis for decisions from a more comprehensive set of criteria than the observable cash flow that is handled in a financial analysis.
2. To study the economic impacts of projects in the aviation sector in comparison with possible projects in other parts of the transport sector, in the course of overall planning efforts.

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The manual

Part one, chapter one presents the foundations of CBA, mainly focusing on:

- the microeconomic framework
- the elicitation of different factor prices
- the use of interest rates in analysing long term effects
- the handling of risk and uncertainty
- the building of the base case and the alternatives
- the problem of mutual interdependency among projects

Chapter two presents the main guidelines on how the CBA should be carried out in practice:

- what conditions make CBA necessary
- a stepwise procedure for carrying out CBA
- assessing economic risk and uncertainty, with guidelines for sensitivity and scenario analyses.
- a procedure for presenting the results
- evaluation of the results, and criteria for recommendations

Chapter three examines the factor prices of various intangibles to be used in the CBA:

- Travel time
- Changes in accident risks, and to what extent different actions (e.g. Precision Approach instruments at regional airports) may influence such risks
- Noise
- Local and global air emissions

Part two contains four examples on applied CBA.

Example 1 is an comprehensive economic analysis of increased capacity of passenger facilities on an airport. This analysis also comprises other transport sectors because the base case assumes that the traffic that cannot be served without the increase in capacity, spills out in the road network. Effects on delays for passengers and airlines are assessed, and the value of avoiding delays are calculated. The total economic and financial impacts are presented.

Example 2 is an analysis of improved technical standard for a short take-off and landing (STOL) airport. The improved standard comprises electronic equipment, runway length, buildings and so forth. The impact on the benefit side is assumed to be the possibility of serving larger aircrafts.

Example 3 deals with improved Instrument Landing System (ILS). The benefit side comprises reduced travel time, improved regularity and an estimated reduction in accident risk and emissions.

Example 4 considers an increase in runway length, where the benefits from improved regularity and aircraft load increase is assessed. The market effects are assumed to occur in the freight market of high-value goods, and in the market for tourism.