Transport appraisal and Monte Carlo simulation by use of the CBA-DK model

This paper presents the Danish CBA-DK software model for assessment of transport infrastructure projects. The assessment model is based on both a deterministic calculation following the cost-benefit analysis (CBA) methodology in a Danish manual from the Ministry of Transport and on a stochastic calculation, where risk analysis is carried out using Monte Carlo simulation. Special emphasis has been placed on the separation between inherent randomness in the modeling system and lack of knowledge. These two concepts have been defined in terms of variability (ontological uncertainty) and uncertainty (epistemic uncertainty). After a short introduction to deterministic calculation resulting in some evaluation criteria a more comprehensive evaluation of the stochastic calculation is made. Especially, the risk analysis part of CBA-DK, with considerations about which probability distributions should be used, is explained. Furthermore, comprehensive assessments based on the set of distributions are made and implemented by use of a Danish case example. Finally, conclusions and a perspective are presented.