



NEW CHALLENGES IN THE COST BENEFIT ANALYSIS OF THE MOBILITY DEVELOPMENT

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INTRODUCTION

Cost-benefit analysis methodology: preparing decisions related to developments that affect wide range of society.

Significant milestones of cost-benefit analysis methodology:

- EU requirements.
- National requirements (first national guides of cost benefit analysis published in 2007 for infrastructure developments, transport and environment).
- A new guide related to the 2014-2020 support period published by the EU, based on which the national cost-benefit analysis guide referred to the transport developments has been also modified.

Assessment of projects

Assessment of strategies and regulations

- Sustainable Urban Mobility Plan (SUMP) several requirements of cost-benefit analysis methodological have also been formulated in the EU guides, based on which the national SUMP guide has been compiled.

Strategic and project-level requirements are linked by the EU:

- The project has to be included in strategies at different levels (national, regional, urban).
- The project-level cost-benefit analysis should also be able to connect to the strategic-level analysis.



OVERVIEW OF THE CHALLENGE

COST-BENEFIT ANALYSIS OF PROJECTS

The aim of the cost-benefit analysis is to justify that the developments are:

- cost-effective;
- present value of their social benefit exceeds present value of their social costs;
- subsidy is provided only to the extent necessary for the implementation;
- during the operation, the established service level is financially sustainable.

Instruments of the cost-benefit analysis:

- options analysis (selection of the best option from);
- financial analysis (for the selected technical solution the investment and operation costs in cash-flow approach, sustainability has to be also analysed);
- the economic cost-benefit analysis (analysis of the social benefit and costs for the selected technical solution);
- sensitivity analysis and risk analysis.

Basics of cost-benefit analysis



Economic analysis

Costs (financial costs with corrections)	Benefits
Investment costs <ul style="list-style-type: none"> • eligible • non-eligible 	Benefits of users <ul style="list-style-type: none"> • Travel time saving • Change of accident risk • Change in vehicle operation cost • Change of local air pollution • Climate change • Change in noise emission • Passenger comfort improvement • Urban development benefits • Other benefits (eg. health impacts, touristic impacts, nature conservation effects)
Operating costs <ul style="list-style-type: none"> • operation • maintenance • replacement 	
Residual value the present value of the net economic cash flows generated during the remaining useful life	
	External benefits
	Non-monetised benefits

Financial analysis

Revenues	Costs
Fees paid by users	Investment costs
Other revenues eg. revenues originating from the sales or rent of land or buildings	Operating costs <ul style="list-style-type: none"> • operation • maintenance • replacement
Other incomes subsidies, eg. private equity contribution	Residual value the present value of the net financial cash flows generated during the remaining useful life
	Reasonable profit

The opinion of the project is determined by economic performance indicators:

ENPV	ERR	BCR
<ul style="list-style-type: none"> • economic net present value (ENPV) • difference between the present value of benefits and costs • ENPV > 0 	<ul style="list-style-type: none"> • economic rate of return (ERR) • shows the rate of return of the project • ERR > 5,5% 	<ul style="list-style-type: none"> • benefit-cost rate (BCR) • quotient of the present value of benefits and costs • BCR > 1

The opinion of the project is determined by financial performance indicators:

FNPV	FRR
<ul style="list-style-type: none"> • financial net present value (FNPV) • discounted value of cash flows generated during the project duration • FNPV/investment, FNPV/C < 0 • return of investment capital FNPV/capital 	<ul style="list-style-type: none"> • financial rate of return (FRR) • means the discount rate, for which FNPV=0 • FRR/K < used discount rate

The project must be financial sustainable:

Cash flow
<ul style="list-style-type: none"> • the accumulated operating cash flow should not be negative in any year

General conditions

Incremental	Baseline	Pricing	Assessment methods
<ul style="list-style-type: none"> • increment between the baseline and the development 	<ul style="list-style-type: none"> • it is considered as a tool for calculation, not as a realistic (eg. one that complies with legal requirements) scenario • more scenarios can be needed 	<ul style="list-style-type: none"> • price level • exchange rate • reference period 	<ul style="list-style-type: none"> • forecast inputs • reliability of results • sensitivity analysis • risk analysis



OVERVIEW OF THE CHALLENGE

COST-BENEFIT ANALYSIS OF PROJECTS

Major changes in the EU cost-benefit analysis manual for the present financial period:

- Cost-efficiency analysis can be used if the assessment of the economic benefits of the major projects is very difficult or impossible.
- Economic benefits can not be assessed based on the fee income, the willingness to pay (WTP) or the clearing prices should be used.
- Connections of projects and project element: financial or technical lots or administrative phases, that can not be considered as operational in themselves, have to be analysed together with the other phases of the major project. If a project includes several distinct and different-purpose components, each component has to be analysed independently.
- Reducing climate change (costs, benefits) should be included in line with the EU's 2050 aims referred to the decarbonisation.
- Limitation of 'polluter pays' principle and 'total cost recovery' principle (taking into consideration solvency limits) is possible if it doesn't risk the financial sustainability of the project. In principle limitations can only be temporary until the solvency of the users is limited.
- Re-definition of the net revenue, the financial gap can be calculated as a flat rate.
- In case of operation not classified as 'net revenue generating' or negative cash-flow: clear, long-term commitment is necessary to cover the deficit.
- In case projects implemented as part of existing infrastructure, the comprehensive financial sustainability of the operator of the whole system has to be also verified.



OVERVIEW OF THE CHALLENGE

ROLE OF THE SUMP

In the Integrated Transport Development Operational Programme (ITOP) the existence of the SUMP is required to support of urban transport projects.

SUMP Guide priority approaches:

- commitment to sustainability,
- integrated approach,
- significant involvement of stakeholders, a meaningful partnership during the planning and implementation,
- requirements on measurable and achievable targets,
- comprehensive review of costs and benefits of transport,
- feedback.

Role of CBA in the SUMP:

- tool-system and the definition, scheduling, and prioritization of the projects,
- expanded CBA: further integrated urban development and sustainability effects, benefits not always being able to be monetized

OVERVIEW OF THE CHALLENGE



COHERENCE OF STRATEGIES AND PROJECTS

Hungarian Transport Infrastructure Development Strategy

- The set of instruments to reach the objectives has been evaluated based on cost-benefit analysis principles.
- On the basis of evaluation social benefit
 - Timing of priority instruments groups
 - Defining of projects by the particularisation of the instruments.

Regional type transport development masterplans are also prepared, which include either line or functional regional level analyses.

In the case of urban transport developments the urban-level SUMP defines the goals, tools, and projects.

Coherence:

- In the different-level strategies, the tools and the projects are needed to build on each other
- Specific project has to be in coherence with the different-level strategies
- CBA made by similar logic in strategies and projects

OVERVIEW OF THE CHALLENGE



FITTING IN THE PREPARATION PROCESS OF GRANTS

Cost-benefit analysis, as a document

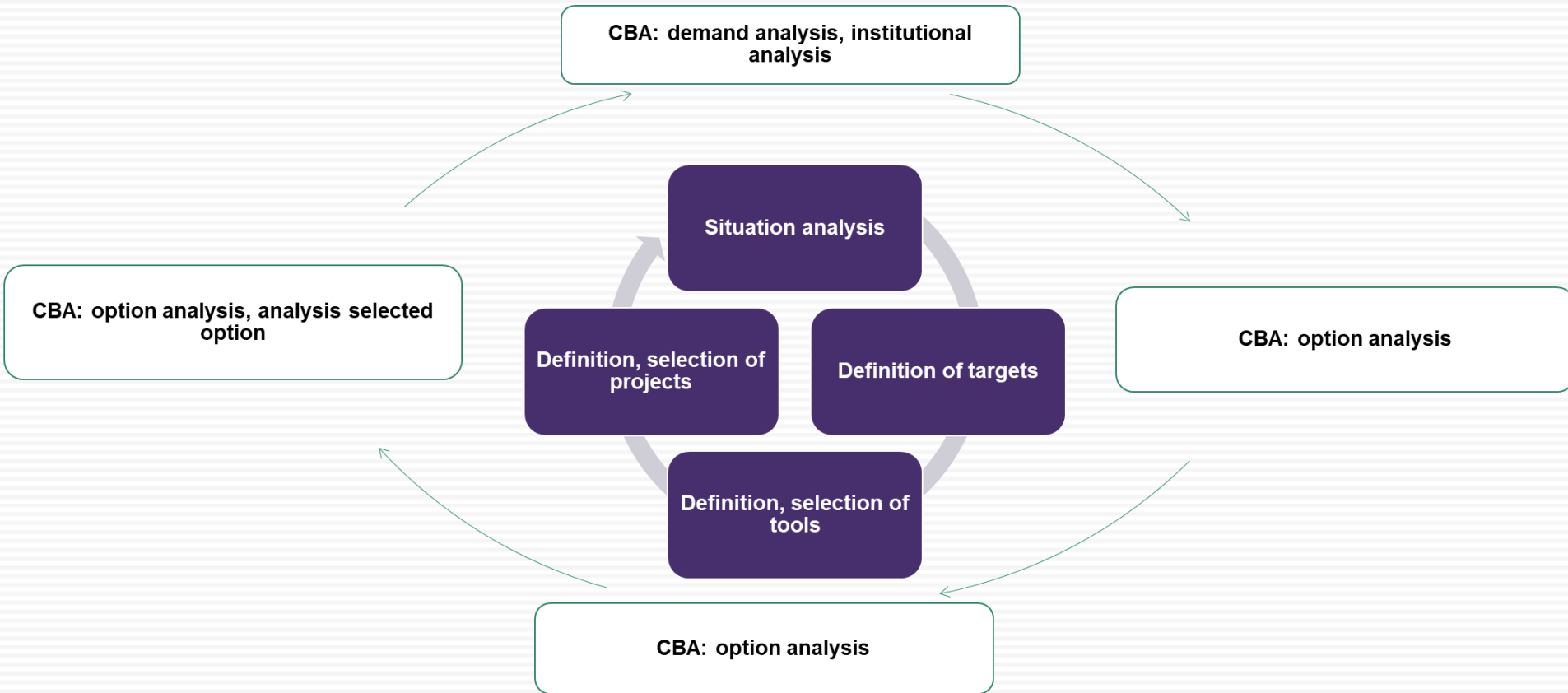
- According to the EU regulations the feasibility analysis and the cost-benefit analysis are presented in two separate documents, in the feasibility study (FS) and in the cost-benefit analysis document (CBA document)
- The aim of the FS is exploring the problem and selecting the best possible solution
- The aim of the CBA document is the final analyse of the selected option and it's operational concept, summarizing the result of the FS.

Cost-benefit analysis, as a methodology

- The cost-benefit analysis method is required at all stages of project development, including in the feasibility analysis.
- Preparation of the projects can be on different levels, the FS and the CBA document can be presented in one or in two separate documents.
- The most important requirement is that the logic of cost-benefit analysis follows the preparation process, during the feasibility analysis and the cost-benefit analysis of the selected scenario.
- The cost-benefit analysis has an important role even when the projects are being closed to check the fulfilment and realisation of the assumptions used during the preparation of the project.

CONCLUSION: IDEAL DECISION SUPPORT

At different levels of strategy making and during project preparation the following process is needed to follow.





Thank you for you attention!