



Concept Symposium 2018

Governing Megaprojects – Why, What and How

How can we use Cost-Benefit Analysis to select the Right Projects?

How can we ensure that viable and relevant projects are selected? The railway project Grendlandsbanen is an example of a huge project in the billion-dollar category, which has a lot of public interest. Its function is to connect two major railway lines in Norway, by building 60 km of new railway. The project has been reviewed over several decades. In the current Norwegian investment plan for transport (NTP) there is substitutional funding for planning and preparation in order to start realizing the project. Grenlandsbanen is an example where the pre-study and the quality assurance of major public interest (QA scheme) arrive at completely different conclusions regarding the benefits of the project. This illustrates the importance of conducting QA-analysis where cost-benefit analysis has a central possession.

The biggest benefit of the project comes by decreasing the travel time between several large cities in Norway (Oslo-Kristiansand-Stavanger). This will increase the railways competitiveness compared to other means of transport, and strengthen public transport. The pre-study, from 2016, recommends a double railroad track at the cost of 25.6 billion NOK (3.2 billion USD). The present value is estimated to be -5.5 billion NOK (almost -700 million USD). However, accounting for regional benefits the project is still considered to have a positive net benefit. The cost benefit analysis in the QA scheme concludes that the project has a negative net benefit of -12 billion NOK (-1.5 billion USD). The difference to the pre-study is due to higher cost and lower consumer impact. Wider economic impacts are also marginal. Even with a substantially increased number of passengers the project will still not be considered beneficial. These results accumulate to the conclusion that the project should not be realized.



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The Concept Symposia on Project Governance

The Norwegian Ministry of Finance and the Concept Research Program hosts every second year a symposium on project Governance. Project governance, in brief, is concerned about investments and their outcome and long-term effects. In view of the problem at hand, the aim is to ensure that the best conceptual solution is chosen, that resources are used efficiently and anticipated effects realized. Resource persons from ministries, governmental agencies, academia, international organizations, and industry are invited. In order to facilitate professional exchange and direct communication between participants, the number of individuals is restricted. The aim is to initiate further international cooperation and research on important issues related to project governance.

<https://www.ntnu.edu/concept/concept-symposium>

How can we use Cost-Benefit Analysis to select the Right projects?

*An example from the project
Grenlandsbanen*

*Concept Symposium on Project
Governance*

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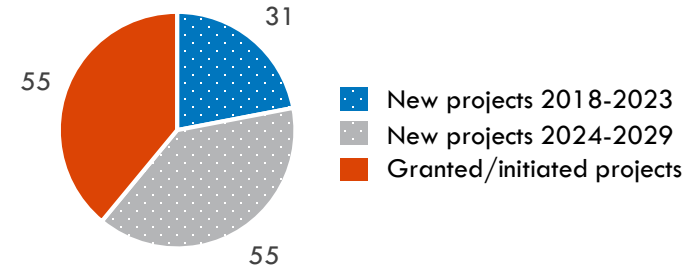


The government are planning large investments in the transport sector

It's not a given that all project can be realized, so how can we ensure that the viable and relevant projects are selected?

- The willingness and ability to finance large and complex public projects can be high
- Local actors can have a strong impact on the planning of the projects but often has no financial obligations
- This shows the need for actions and tools which ensures necessary knowledge to select and prioritize projects

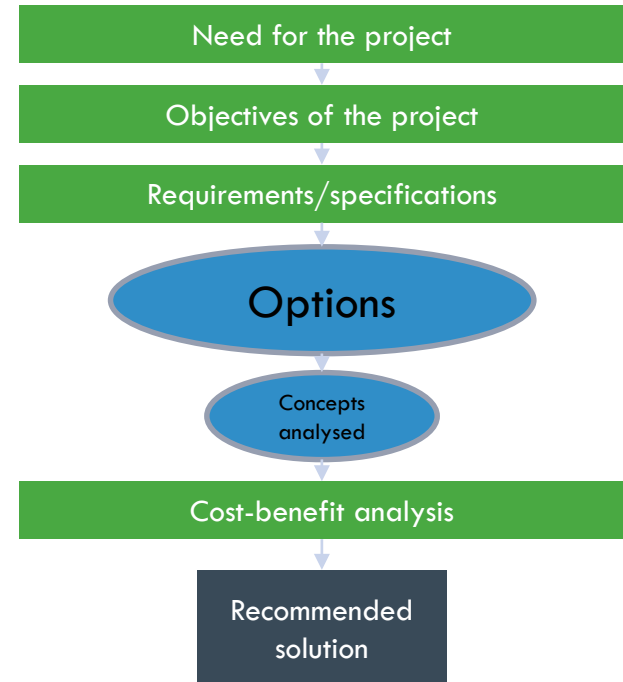
Number of transport projects in the Norwegian investment plan for transport (NTP)



Source: NTP 2018-2029

In the choice of many large projects, how do we ensure that the “right” projects are selected?

- Cost-benefits analysis has a central position in the Quality Assurance scheme:
 - Cost-benefit analysis helps mapping and visualize the impact of the investment
 - Cost-benefit analysis are a tool that can help to improve the decision-making for public investments



The purpose of the analysis is to identify the effects the project gives for different groups in the society



Monetized impacts

- The effects can be divided into four main components
 - Consumer impacts
 - Producer surpluses
 - Budgetary impacts in the public sector
 - Impacts on society at large



Non-monetized impacts

- It's not possible or proper to set a price on all effects
- These effects are nevertheless of importance and should be accounted for in the analysis
- Common effects are effects on landscape image, biodiversity, local environment and possibilities for outdoors activities, natural resources and cultural heritage

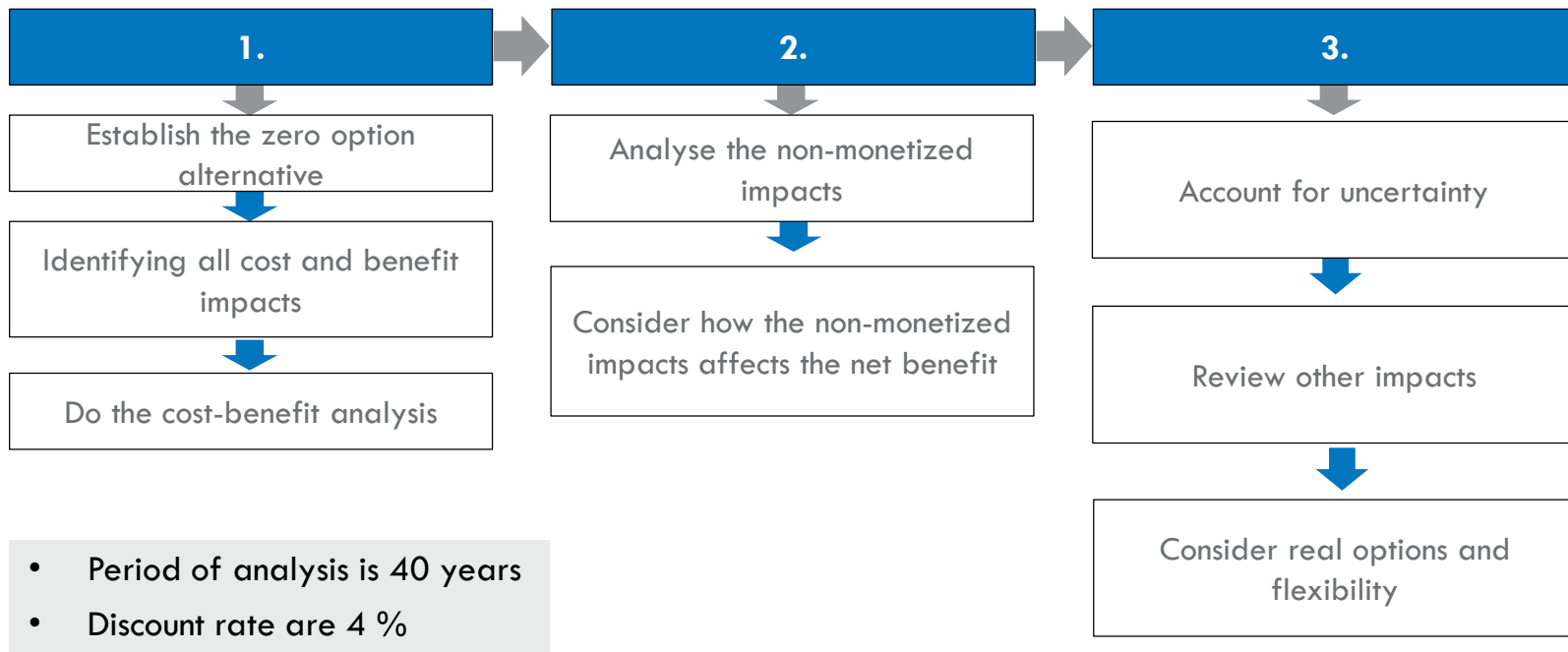
The railway project *Grenlandsbanen*

- Its function is to connect two major railway lines in Norway, by building 60 km of new railway
- Reduces the travel time between Oslo and Kristiansand by about 1 hour
- Reduced travel time will increase railways competitiveness compared to other means of transport
- The pre-study recommended a double railroad track at the cost of 25,6 billions NOK
- In the current Norwegian investment plan for transport (NTP) there is substitutional funding for planning and preparation to start realizing the project



Source: KVV Grenlandsbanen

How do we design the analysis?



The monetized impacts of Grenlandsbanen



Consumer impacts

- Reductions in generalized travel cost for users
- Induced additional travel
- Effects on other means of transport



Budgetary impacts in public sector

- Investment cost
- Maintenance and operation
- Other expense for the government, including tax income and subsidies disbursed



Producer surpluses

- Revenue of the system operator
- Costs for the system operator
- Giving change in the need for «public purchases» (subsidies)

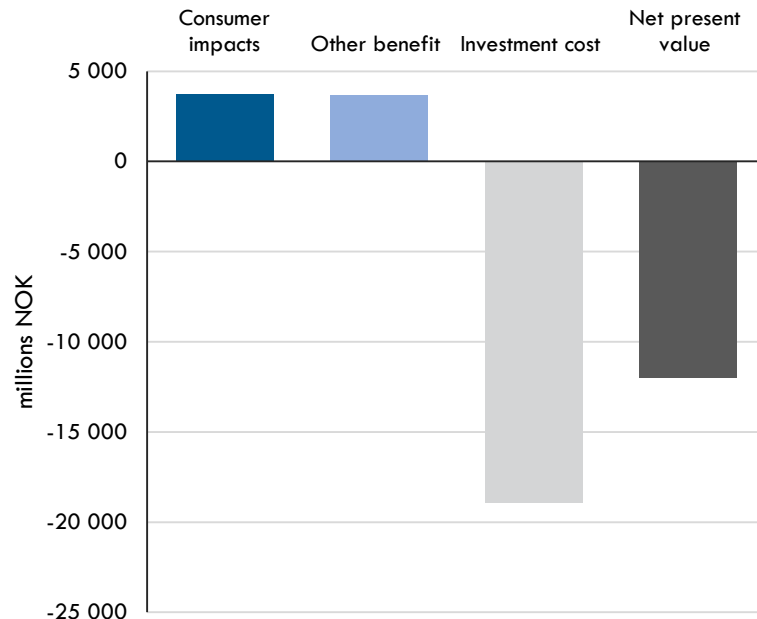


Impacts on society at large

- Reduced accident
- Reduced noise
- Reduced external effects on the environment: local air pollution and greens house gas emissions

The monetized impacts of Grenlandsbanen

- The biggest benefit of the project comes by decreasing the travel time between several large cities in Norway (Oslo-Kristiansand-Stavanger)
- Other benefit components:
 - Reduce the need for public subsidies
 - Only small benefit from reduction in emissions and accidents
- High investment cost due to considerable uncertainty
- The cost-benefit analysis concludes that the project has a negative net present value of approximately -12 billions NOK



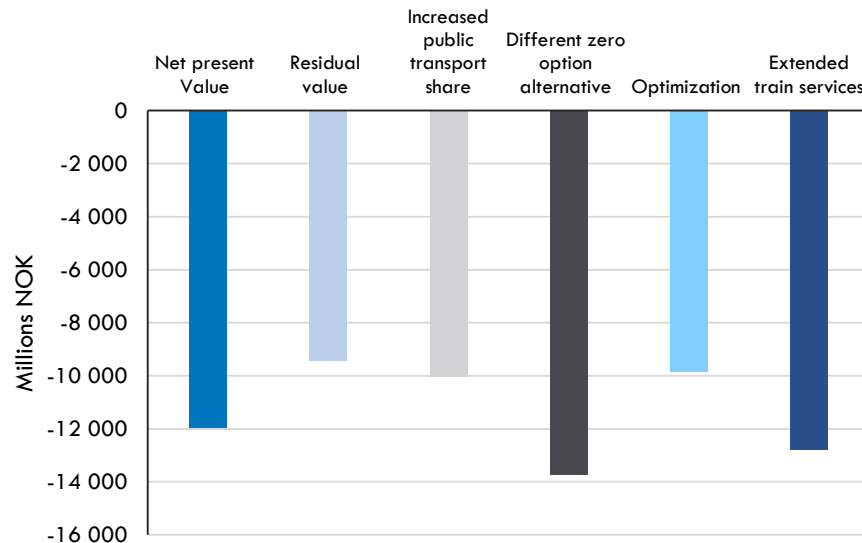
The non-monetized impacts of Grenlandsbanen

- The non-monetized effects are valued on a scale ranging from -5 to +5
- The non-monetized impacts of the analysis provides even more negative net benefit
 - This can be explained by the fact that the project affects untouched and valuable areas

	Concept alternative
Landscape image	0/-
Cultural heritage	--/---
Biodiversity	--/---
Local environment and possibilities for outdoors activities	0/-
Natural resources	0/-
Contributions to net benefit	Negative

What happens to the benefit if we change key assumptions?

- Residual value of the infrastructure
- Increased public transport share
- Different zero option alternative
- Optimization of the solution
- Extended train services



Are there any other effects not accounted for that can make the project profitable?



Wider economic benefits

- If any, we find a limited potential for wider economics benefits
 - Still considerable travel time between the big cities
 - Few inhabitant in the analysis area



Real options

- It is not profitable to decide to build the Grenlandsbanen today
- Big uncertainty about the cost and benefit, and long time until realization, could make it more profitable to wait with the decision
 - The option value is so low that it does not justify keeping the option active

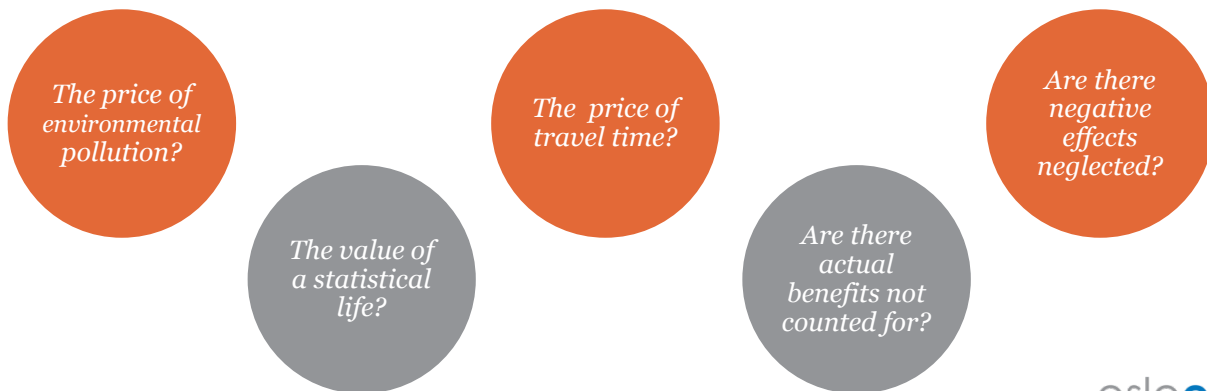
The conclusion

- The project has a negative net present value
- Accounting for non-monetized impacts makes the project even more unprofitable
- Nor optimization of the concept makes it profitable
- Wider economic benefits only to a small extent affect profitability
- We therefore do not recommend a realization of the project



What are the challenges with the framework of the analysis?

- It can be the case that effects are underestimated or omitted
- It can be argued that some impacts are not valued highly enough in the analysis. For example:
 - Do we take effects on the environment enough into account?
 - Do we capture the effects on more integrated housing and labour market right?
- If not, it's the pricing we need to discuss. Are we sure that the cost-benefit analysis represents the right prices?



What are the challenges with the framework of the analysis?

- Recommending and ranking projects on more than the result of the cost-benefit analysis (accounting for both monetary and non-monetary effects) gives a risk of double counting effects
- We should continue to develop cost-benefit analysis rather than introduce other criteria or analysis when recommending projects

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