

Infrastructure costs

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Issues of infrastructure costs

- Capital costs for the infrastructure project
- Residual value
- Optimism bias
- Running costs:
 - Costs for maintenance, operation and administration
 - Changes in infrastructure costs on existing network

Definition

- **Construction costs**, including materials, labour, energy, preparation, professional fees and contingencies
- **Planning costs**, including design cost, planning authority resources and other costs incurred after the decision to go ahead
- **Land and property costs**, including the value of the land needed for the scheme (and any associated properties), compensation payment necessary under national laws and the related transactions and legal costs
- **Disruption costs**, i.e. the disruption to existing users to be estimated using the same values of time as are used for travel time savings arising from the scheme.

In line with EUNET and country practice

Two general principles

- Costs should be attributed to the project year in which the resources become unavailable to alternative uses
- It is necessary to distinguish between
 - Costs incurred before and after the decision whether to go ahead with the project or not
 - Retrievable and non-retrievable costs

More details on how to treat each of the four elements are given in the text

Residual value (I)

Background

- An item which captures net benefits beyond the formal evaluation period
- The residual value is often of relatively little importance

Recommendation

- Pragmatic approach (2 elements)
 - Fixed lifetime of the infrastructure (or its sub-components)
 - Linear depreciation profile

Lifetimes by mode and group of components (example: road)

Group of components	Min	Main	Max
Base course	30	45	60
Wearing course	10	20	30
Environmental installations	10	20	30
Drainage	50	75	100
Retaining walls	50	75	100
Bridges	50	75	100
Tunnels	50	75	100
Land	Infinite	Infinite	Infinite

If lifetimes outside these ranges are used, it has to be explicitly stated why such an approach is taken

Tendency to underestimate construction costs

- Cost escalation occurs in almost nine out of ten projects
- Actual costs on average are 28% higher than estimated/forecast costs
- Cost overrun seems to be a global phenomenon

Ideas to reduce uncertainty/cures to optimism-bias

Guidelines	Process	Organisation of risk/uncertainty
Benchmark projects	Independent reviews	Change incentive structure
Use reference class forecasting	Engage stakeholders etc.	Make forecasters share financial responsibility
	Make all information publicly available	Make go-ahead contingent on private risk capital
	Make sure guidelines are applied consistently across member states	In PPPs, make size of subsidy dependent on accuracy of forecasts

Source: simplification of Flyvbjerg's presentation at the first HEATCO work shop, own categorisation

Optimism bias (III)

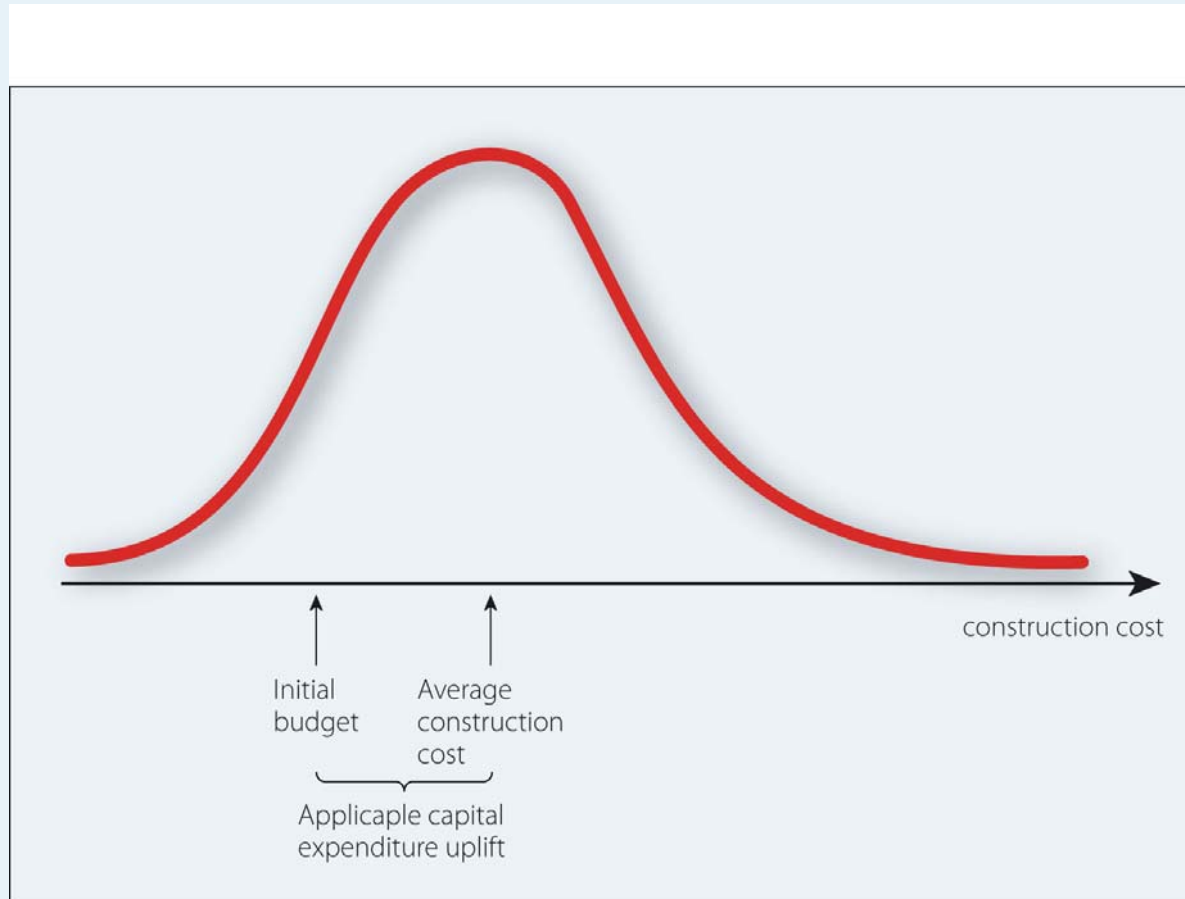
Recommendation

- Make side-analysis, where optimism-bias uplifts are applied
- If feasible -> Continue appraisal
- If not feasible
 1. Benchmark cost estimates to realised costs of similar projects
 2. Justify why cost estimates are lower
 3. Revise construction cost estimate

Why 'only' side analysis?

- Complex issue
- Part of uplifts can be attributed to benefit-generating improvements

Applying the uplifts



Applicable uplifts

Category	Uplift
Roads	22%
Rail	34%
Fixed links	43%
Building projects	25%
IT projects	100%

Running costs (I)

Two elements

- Costs for maintenance, operation and administration
- Changes in infrastructure costs on existing network

Complex task to give recommendations, as the countries have different

- Standards of infrastructure, composition of traffic, maintenance practice, approaches to cost accounting, climate and topographical conditions, etc.

Recommendation

- **First best**
 - Use national default values (check applicability)
 - Available for road in 50% of countries
 - Available for rail in 25% of countries

- **Second best (2 steps)**

1. Distinction between fixed and variable costs

- National accounts/statistics
- General classification of cost categories into "fixed" and "variable"

2. Allocation of variable costs to cost drivers

- Two simplifying assumptions
 - The marginal costs per vehicle can be approximated by the average variable costs
 - Average variable costs/marginal costs are constant (and not for instance increasing with traffic)
- Allocation factors:
 - Weight dependent (ESA)
 - Non-weight dependent (vkm)