



RIKSREVISIONEN

Summary:

Cost control of large road
investments?

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The Swedish National Audit Office (the Swedish NAO) concludes that the problems with cost increases for large road investments that were brought to light by its predecessor (Riksrevisionsverket) in 1994 still remain. The inflation rate in the sector is high – between 2000 and 2009, prices in road building increased by 35 per cent, while for the rest of the economy prices rose by 15 per cent. This is an essential part of the explanation for why road investments become more expensive than estimated. *On top of* this cost increase, the Swedish NAO's calculations show that total expenses for road investments completed between 2005 and 2009 increased by an average of between 8 and 18 per cent on the initial cost estimate. Costs for geotechnology are often underestimated in the National Road Administration's (as of 1 April 2010 the Swedish Transport Administration) initial estimates, and additional costs for these purposes are often considerable. Another reason for cost increases is that external stakeholders often negotiate their way to additional assignments, beyond what was planned and ordered at the outset.

Grounds for the audit and the concept of cost control

Large infrastructure investments often become more expensive than planned. From a budgeting perspective, these systematic cost increases mean that the allocated resources do not produce the planned amount of infrastructure. At a societal level, systematic cost increases imply a risk

of public funds being spent on inefficient investments. The unfavourable price trend in the construction sector reinforces these problems since it means that the taxpayers' money produces less each year compared to other areas of public spending. In all these contexts, it is crucial that the government and its agencies ensure tight cost control and a high level of cost consciousness in road investment activities. This cost control is what that the Swedish NAO has audited.

The term cost control can be described as having three pillars. First, data on actual costs in relation to budgeted, or "planned", costs need to be compiled. Second, routines to examine why cost outcomes diverge from planned costs need to be applied. Third, the organisation needs to have developed a working method for keeping costs down (i.e. cost consciousness). Implicit in this is the ability to deal with cost increases, as they arise, in the most effective manner.

Extensive procedures and many stakeholders

Many actors are involved when roads are planned and built in Sweden. The procedure for how elected politicians decide which roads to build ("the infrastructure planning process"), in combination with the procedures for planning and building a road, tend to make the national and regional investment plans that the political bodies ratify too extensive in relation to allocated means – right from the outset. Legislation to protect the environment, municipal autonomy and individual citizens, subsequently contribute to delaying investments, thereby making them more expensive (see Cars et al., 2009). For an investment project, there is an "eye of the needle": once a project is included in a ratified investment plan, it will be built regardless of how its costs evolve. This effectively weakens cost control incentives.

The National Road Administration's reporting on investment costs conceals cost increases and lacks sufficient evidence

It is the Swedish NAO's assessment that the reporting on cost developments for large road projects included in the National Road Administration's annual financial reports for 2005 to 2009 does not present a fair picture of cost developments. The reports *underestimate cost increases* in two ways. First, the unfavourable price trend in the construction sector is made invisible by the application of the Administration's own "Road Index" – a price index series intended to

reflect the sector's price trend. The Swedish NAO has demonstrated that a hypothetical investment project, which when using the Road Index is estimated to meet its costs almost exactly, in fact corresponds to a cost increase of just over six per cent when a standard price index is used. Second, by the application of the National Road Administration's and the government's principle of comparing a road project's final cost to its most recently ratified cost estimate. This means that a project's price increases which occurred before the most recent (national or regional) investment plan, are not included in the cost development figures. It is the Swedish NAO's assessment that the government's reporting requirements in its appropriation directive to the then Road Administration were insufficient and that reporting to the Riksdag (the Swedish parliament) has been inadequate as a result.

Deficient follow-up

Where infrastructure investments are concerned, the follow-up has been deficient on two levels. Firstly regarding the investment activity within the Road Administration/Transport Administration and secondly at the national/regional investment plan level.

In order to contain future cost increases and to be prepared to deal with those that arise all the same, cost developments in road projects need to be followed up, which is to say that information about cost increases and their reasons need to be compiled in a systematic fashion. The Swedish NAO concludes that the Road Administration/Transport Administration has not carried out any follow-up in the form of systematic compilations of cost divergences and the reasons for them.

The public investment plans' time periods overlap. This means that a ratified investment plan will not run its full course before it is substituted by a new plan. This makes it difficult to follow up an investment plan in order to see if it provided the amount of road at the price and within the time limit it specified. Cost increases and delays from one investment plan thus create the conditions for the next plan. This means that lagging investments and cost increases from the earlier plan are financed once again in the next plan, so to speak. Cost increases and delays are effectively concealed, which undermines cost control of the funds allocated for transport and infrastructure investments.

Four problems with the Road Index

The National Road Administration's use of a "home-made" Road Index leads to four different problems which all lead to weakened cost control. *First*, the use of the Road Index leads to cost increases due to the high price inflation in the construction sector being effectively concealed in the annual financial report. In fact, the unfavourable price trend in the sector is an important *cause* of cost increases.

Second, using a sector-specific price index brings a number of practical problems. Cost development comparisons between the road sector and in the rest of the economy become impossible. The use of a sector-specific index is also a potential source of miscalculations and reporting errors.

An argument for using the Road Index is that it captures costs which are beyond the control of the Road Administration (also known as *exogenous* costs). The *third* problem is that it is unclear whether the Road Index really reflects the true price trend in the sector, and how much of this is really beyond the Administration's control. The Road Administration is a major actor in the construction market. Such a large buyer should be able to influence market prices. At the Road Administration, however, the dominant procurement form has not made full use of this possibility.

The *fourth* problem is that a widespread use of the Road Index risks lowering cost consciousness within the Road Administration since it implies a lower cost pressure.

Insufficient risk assessment in project calculation and infrastructure planning

Rigorous cost control requires that economic risk is considered and handled in a suitable way. The Road Administration recently implemented a new method to this end, known as the successive principle. This involves assessing the costs and risks of a project in a systematic manner. However, *optimism bias* tends to make everyone involved in a project underestimate its costs, albeit unconsciously. Furthermore, the "eye of the needle" effect means that there are strategic incentives to underestimate a project's costs. According to a large body of research (e.g. Flyvbjerg, 2006, and references therein), the successive principle as it is employed by the Road Administration will not fully counter neither the optimism bias nor the strategic cost underestimates. There is thus a risk that costs for individual projects will continue to be underestimated. This in turn implies a clear risk that both the economic risk and the cost of entire investment plans will be underestimated.

Project managements' authority too extensive

The former Road Administration employed a decentralised working method in which the project managements for large road investments were given a relatively free rein, with little control and little support from higher levels in the organisation. Among other factors, this probably had to do with a perception within the Road Administration that all projects are unique. This has led to great variations in how projects are carried through. For example, the Road Administration has done little in order to encourage the use of uniform instruments and routines for keeping costs down and to prepare for dealing with unexpected cost increases in the best way.

Recommendations

The Swedish National Audit Office recommends the Transport Administration to

- improve the quality of the reporting on investment cost development in their annual financial report
- develop a comprehensive framework for following up cost divergences and the reasons for them
- improve documentation of important events and costs of projects
- limit and clarify its use of the Road Index
- strive for a more uniform set of working methods in road investment projects.

The Swedish National Audit Office recommends the government to

- consider initiating an analysis of outcome-based cost estimation methods
- improve the follow-up of investment plans.