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PLANNING FOR A SUSTAINABLE TRANSPORT SYSTEM

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Summary

The overall goal in Swedish transport policy is to ensure an efficient and sustainable transport system. This means sustainability from a social, economic and ecological point of view. To improve the present planning system, which is based on cost-benefit analysis, the Swedish National Road Administration (SNRA) is currently developing new methods based on target-oriented planning. Key elements in this are to identify the needs and demands of road users as well as the demands implicit in the concept of sustainable development.

Cost-benefit analysis takes several key factors into account. However, it does not include the fair distribution of wealth or several other important aspects, such as regional development, social coherence or impact on environments of natural and cultural value. In order to improve the planning system and achieve better results in both new road construction and road maintenance, targets and indicators are currently being developed for these aspects. This paper deals with one of these projects and involves natural and cultural heritage values.

The project was launched in 1998 and the primary aim was to find a workable structure that allowed for overall goals and measures on the national level without jeopardising the need for local adaptations. The solution became planning based on quality standards. National goals for roads are broken down into clear targets and criteria for different situations. The local situation and local knowledge are included and the output is project targets. The resulting road is subsequently monitored and checked against the project targets to determine whether the quality standard has been met. At a national level, the percentage of roads meeting the quality standard can be seen as an indicator of progress. Existing roads can also be examined in order to audit the need for improvement.

The method is currently being tested in actual road projects in order to determine the need for further development. The intention is for the method to be developed by 2005. It is believed that it will provide a more structural approach to facilitate the inclusion of natural and cultural heritage values in the road planning process, and that it will be a good complement to cost-benefit analyses and environmental impact assessments. Early indications also show that it can facilitate the planning process and allow for a constructive dialogue with authorities and organisations that promote natural and cultural heritage values.

Introduction

There are more than six billion people living in the world today, and the demand for natural resources and health and welfare is ever-increasing. At the same time, a growing consciousness of environmental problems demands action to prevent the depletion of the available natural resources in the future.

Understanding that our present situation is unsustainable entails a gigantic challenge for the global community. The trend must be broken, and economic and social welfare must be increased in conjunction with efforts towards ecological sustainability. In the general public debate in society, different interest groups often demand that their favourite aspect of sustainable development be in focus, often ignoring the findings of the Bruntland Commission stating that the three aspects of sustainable development (social, economical and ecological) are interdependent.

The situation is identical if we narrow down the debate to the road transport system. Road transport is the dominant mode of transport worldwide. Thus, the road transport system is a prerequisite for trade and commerce and for human interaction. An efficient road transport system is necessary for sound economic and social development. At the same time the negative aspects of the road transport system are a major threat to the environment. This leads to the simple, but serious conclusion that we cannot continue as before. We have to find new ways to solve transport problems in the future so that the transport system supports truly sustainable development.

However, it is clear that the concept of sustainable development is easier to adopt in a general paper such as this, than in the complicated reality of everyday life. To achieve a sustainable road transport system, difficult and complicated political decisions must be made. In addition to this, new and improved methods of planning must be found. When planning improvements in the road infrastructure, several new aspects must be taken into account so that the infrastructure supports economic, social as well as ecological development.

One obvious prerequisite for an efficient planning process is to have clear goals and targets for the demands placed by individuals and the business community as well as the demands associated with a sustainable transport system. Sweden has had longstanding experience in using cost-benefit analyses to facilitate efficient road planning. Travel time savings, lower transport costs, road safety improvements, the cost of noxious emissions, etc are included in the analysis. However, the present cost-benefit analysis does not include several of the key factors for a sustainable road transport system, such as the impact on environments of ecological and cultural value, social cohesion and regional development. Furthermore, criteria affecting the fair distribution of wealth within the country are difficult to address through simple cost-benefit analysis. We are therefore developing targets and indicators for these areas. One programme that is currently being tested in full-scale projects addresses the complex but vital subject of preserving and developing natural and cultural heritage values.

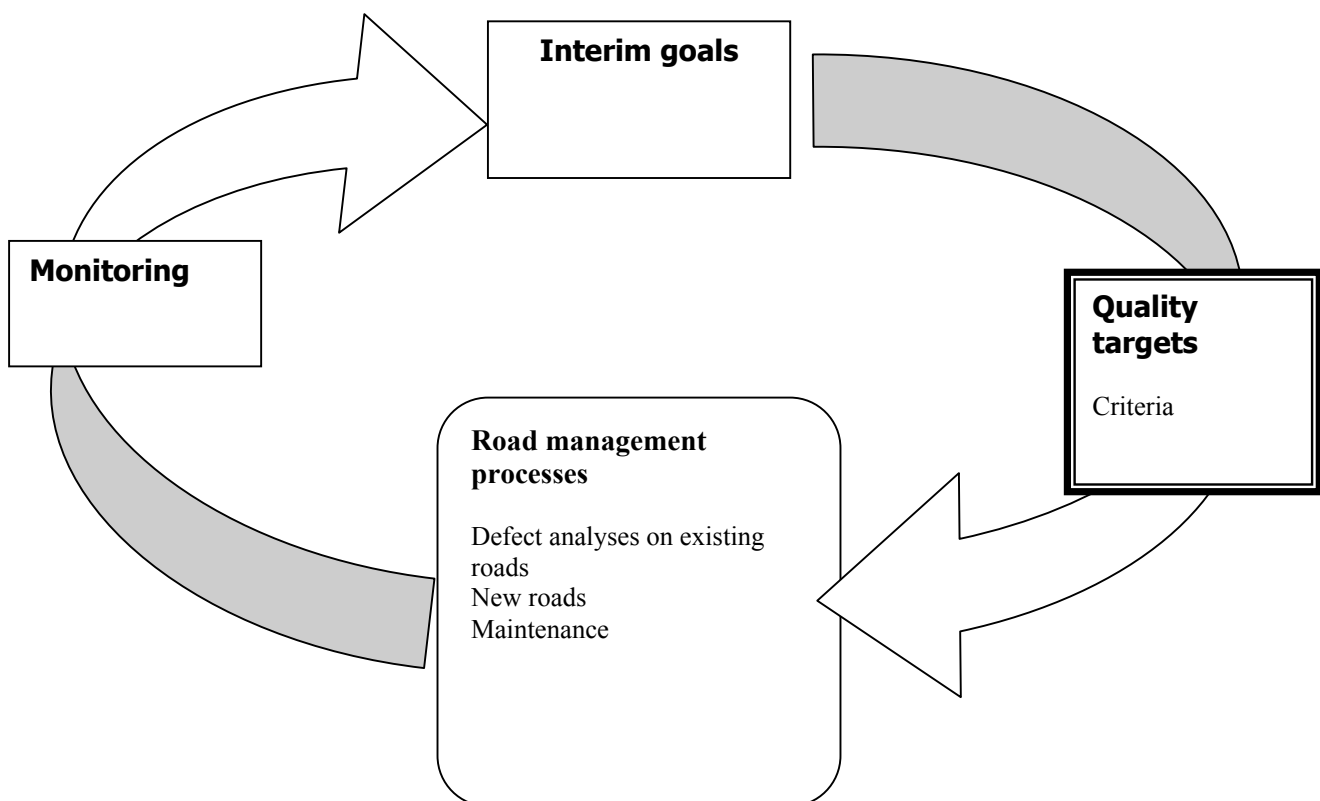
Targets and indicators for natural and cultural heritage values in the transport system

The overall aim of the project was

"To enable the Swedish National Road Administration to build and maintain roads in a rational and efficient manner while ensuring good quality through taking natural and cultural heritage values into consideration."

This is to be achieved by developing goals and strategies for the natural and cultural heritage values in the road infrastructure. A few years ago, the Swedish National Road Administration, the Swedish Rail Administration, the Civil Aviation Administration and the National Maritime Administration presented a joint proposal concerning the consideration that should be given to the natural environment and cultural heritage landmarks within transport infrastructure. The proposal comprised:

- a principle for *interim goals*
- *quality targets and quantifiable criteria* to give interim goals a precise content
- *methods for the integration of the quality targets into the three components of road management*: new construction, maintenance and defect analysis of the existing road network
- principles for *monitoring and quality assurance*.



The proposal entails:

- a common structure, with quality targets and criteria allowing transparency in the discussions on level of ambition and costs
- measures in national and regional long-term infrastructure planning relating to the natural environment and cultural heritage in the road transport system that could be considered in relation to other needs, such as road safety measures, measures to increase bearing capacity, etc
- integration of new knowledge without having to change the system
- natural environment and cultural heritage considerations are integrated into the road planning and maintenance processes and assessed in relation to other goals
- monitoring will be specific, clear and informative at all levels.

Quality targets and criteria

A level of quality that the road infrastructure is to achieve is defined in reference to the national environmental quality goals, the national goals for a sustainable transport system *and* the operation of the road transport system and its impact on natural and cultural heritage values. This level is defined through a hierarchy of targets, based on four overall goals formulated in more general terms. These have been expressed as specific quality targets, which in turn are defined by criteria that are quantifiable.

The quality level that is defined in this way is based on the best current knowledge available. Owing to the structure of the target hierarchy, new knowledge can be easily incorporated without the system being affected.

The quality level is to be regarded as that which the transport infrastructure can reasonably be expected to achieve, and in this way enable the actual fulfilment of national environmental goals, provided that all the sectors concerned, such as forestry and agriculture, contribute with the components they can influence.

National interim goals

The interim goals are linked indirectly rather than directly to natural and cultural heritage values as they refer to a percentage of the Swedish road network that is to meet the desired quality level. They have been formulated according to the following principle:

By the year 2007, 90% of newly constructed roads shall achieve the quality requirements for natural and cultural heritage values.

By the year 2007, 40% of the maintenance districts shall achieve the quality requirements for natural and cultural heritage values.

By the year 2010, 15% of the existing road network shall achieve the quality requirements for natural and cultural heritage values.

The advantages are: Simplicity and clarity. Changes in the quality requirements due to new knowledge need not affect the system. At the political level, a clear balance will be achieved between the resources available and the priorities given to the target areas. Simplifies control and monitoring at the political level.

Integration into the road management processes

The quality targets are integrated into the planning, design and operation and maintenance activities through adaptations in the existing processes at the SNRA. The most important change is that the processes will be target-oriented.

For new construction, the quality targets and criteria function as support in formulating project targets for the natural and cultural heritage values affected in a specific case. The level of aspiration with respect to these values can and should be determined in consultation with the regional and local authorities (county administrative board and municipality). They also act as a checklist, which guarantees the general quality level.

As regards the operation of the road system, the quality targets are used to formulate "operational targets" to be met within a maintenance district.

For the existing road network, quality targets and criteria are used to achieve a desirable condition. So-called "condition targets" are used to identify defects (defect analysis). The measures required are described and the cost is calculated. This is used as input for long-term action planning when measures affecting natural and cultural heritage values can be weighed in relation to other needs.

Monitoring

At the local and regional level, the project, operational and condition targets make it possible to monitor the situation concerning natural and cultural heritage values in the transport system clearly and precisely. This applies to newly constructed roads, maintenance districts and the existing road network at the county or regional level.

At the national level, it is the *proportion of roads* that meets the specified targets that is monitored.

Monitoring is supplemented with a follow-up of a number of key factors; e.g., animals killed in traffic on different road types and in different landscapes, traffic mortality rates for certain particularly vulnerable species like otters and badgers, population density of certain species indicating fragmentation effects, etc. This shall preferably be carried out in cooperation with the national environmental surveillance system.

Planning new roads: an example

Integration demands changes in the road planning process. The most important general changes are:

- The processes shall focus on solving a problem and not, as previously, on planning for a certain solution.
- The processes shall be target-oriented, i.e. targets shall be formulated for all target areas: accessibility, mobility, road safety, natural and cultural heritage values, etc in terms of project targets.
- Analysis of measures and impact is conducted in reference to the project targets. The result is an open process in which the most appropriate measures are found through analysis of the proposed measures in relation to the project targets.
- The environmental impact assessment is thereby also naturally integrated into the road planning process.
- Conditions for target achievement, e.g. measures to be taken to reduce the impact on the natural and cultural heritage values will become clear and easy to monitor and implement through the planning process, design and construction.
- The method can complement cost benefit analysis as a basis for decision-making.

For environment and cultural heritage values, the most important changes are as follows:

- Planning is no longer based on the conservation and protection of certain designated values (which answered the question on how to avoid restricted areas), but will focus on development, relationships and functions (and answer the question as to whether a road can be constructed without damaging essential natural and cultural heritage values)
- The targets become more specific as the process unfolds. In the early stages (feasibility study and preliminary design/alignment plan) the focus is on qualities. The targets describe *what* is to be achieved. It is not until the late stages (final design plan and construction documents) that the targets describe *how*. The targets shall at all times form a hierarchy which can be traced right back to the initial overall quality targets in the feasibility study.

Results to date

An assessment performed by the Department of Landscape Planning, Swedish University of Agricultural Sciences, shows the following:

Advantages

- interactive process, which supports active participation by the general public
- highlights and clarifies conflicts
- clarifies, early in the process, the values and qualities that the measures are intended to achieve. (WHAT shall be achieved). This simplifies permit procedures. Due to the fact that what shall be achieved is in most cases very vague at present, to be able to perform their assessment the authorities that issue permits require very detailed information on how the road will be constructed, which results in cumbersome and time- consuming permit procedures. (The SNRA ought to be in the best position to judge HOW the qualities will be achieved.)
- focus on problems and targets instead of measures promotes a relaxed and creative interactive atmosphere, dialogue and cooperation
- local knowledge and assessments are taken into consideration and are given scope
- pragmatic process, i.e. it gives scope for new solutions
- provides a systematic approach and continuity in the work
- facilitates the learning process
- greater respect for others' point of view, which engenders trust
- new relations and networks
- vertical integration in the policy process
- self-reinforcing process
- clarification of system boundaries
- insight into the importance of a good decision base
- a stimulating way of working.

Problems

- difficult to break away from familiar patterns that focus on measures to alleviate conflict; project manning
- sets high demands on process and project management (requires a good process manager rather than a good road designer as project manager)
- demands a new approach to the management of natural and cultural heritage values
- challenges established approaches in the organisation ("We are road designers and engineers, not solvers of communication problems")
- difficult to achieve sufficient quality in the work on procuring input (lack of expertise and unfamiliarity in requiring such expertise)
- the mandate received by the project participants from the parent organisation e.g. county administrative board/municipality is often vague

Further development

The proposal submitted to the government was drawn up in 1999-2000. There were three primary cornerstones in the development work: design, field tests and analysis. The aim is that targets and indicators for considering natural and cultural heritage values shall be applied throughout the SNRA from the year 2005.

Although the work is primarily managed and conducted by the SNRA, there is some external collaboration with universities. A review of quality targets and criteria is conducted in cooperation with the authorities responsible for the area concerned: the National Environmental Protection Agency or the Central Board of National Antiquities.

Conclusions

Efficient planning for a sustainable road transport system demands a clear understanding of what a sustainable road transport system is. At present, Sweden has concrete targets with respect to road safety, emissions and noise but not for transport quality, regional development, accessibility and impact on environments of natural and cultural value. In practice, this makes it difficult to find optimal solutions and impedes discussions with other authorities, private individuals and stakeholders.

Targets and indicators for natural and cultural heritage values in the transport system have been developed and are presently being tested. Preliminary indications suggest that having comprehensible targets for road projects facilitates the planning process while improving quality. There are also strong indications that clear targets should not just include natural and cultural heritage values but also such considerations as access and mobility, road safety, etc. The cost involved in this method is incurred primarily during the initial planning and design process, when targets must be set. The benefits are reaped later on when these targets lubricate the process, not to mention the better quality of the road constructed.

It appears that this facilitates the dialogue with both the general public and other public authorities, and it is the hope that target-oriented road planning will ultimately lead to new solutions. Together with environmental impact assessments and cost-benefit analysis, target-oriented road planning could be an important tool for achieving a sustainable road transport system.