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Transport SEA: A Nordic Perspective

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The Nordic Road Association (NVF) is a forum for the Nordic countries' co-operation in the road and road transport sectors. The Association is also affiliated with the World Road Association (PIARC). NVF congresses are held every four years. Between congresses, the work of the sections forms the basis of NVF activity. The goal of the NVF Environment Section is to transmit environmental knowledge and experience in the road and road transport sector. Within the 1997-2000 term, a working group of the Section has studied strategic environmental assessment for the transport sector /1/. The work started with a review of the state of the art in Finland, Denmark, Norway and Sweden, and international development trends. Based on an assessment, the working group presents a perspective on further development.

In the Nordic countries, Strategic Environmental Assessment has mainly been implemented through pilot projects. In official guidelines, SEA was generally introduced 1993-97. Most of the pilot projects have dealt with transport concerns, especially transport corridors. But there are also examples of transport policy assessment and broader assessments.

1 AN OVERVIEW OF DEVELOPMENT IN SOME NORDIC COUNTRIES

DENMARK

Beginning in 1993, the Government has issued directives on environmental assessment of law proposals and other Government proposals, plans and statements to Parliament. Development of regional plan SEA started in 1995 /2/. In 1998, a transport corridor SEA was made for the Odense-Svendborg motorway, on main road 9.

The State Budget proposals for 1997 and 1998 include an environmental assessment, focused on the most important sectors. The assessments were made separately from the budget process, but they present an analysis of environmental trends, the implications of the Budget and the attainment of environmental objectives. For instance for transport, the assessment for the 1999 Budget notes that the policies and actions adopted mean that the environmental objectives for 2005 will be attained except for CO₂ emissions, where additional measures will be necessary to avoid a 25% increase – the objective is to stabilise emissions at the 1998 level. The assessment also reviews the environmental policies and programs of the Road Administration.

At the start of *the Odense-Svendborg motorway* project EIA, it was proposed that one should, instead, increase rail transport on this route. The Road Administration decided to make a corridor study, including rail transport in the assessment.

The study shows that an increase of 1200 daily rail passengers can be achieved, but this will reduce car traffic by only 200-300 cars per day. But if rail transport is not improved, building the motorway will lead to some 100 persons per day moving from train to car. If both the road and the railway are improved, there

will be an increase of some 1100 rail passengers. As a result of the study, it was decided to proceed with both projects. Train travel times will be reduced by 40% and the number of trains will be increased.

In the 1999 preparatory document for *the Regional Plan Revision 2001*, the Government proposes systematic SEA for all regional plans, noting that the environmental impacts, including the possibilities for sustainable development, should be presented and discussed in connection with the development alternatives.

FINLAND

The Finnish EIA Act came into force in 1994. The Act also contains a stipulation that when an authority prepares a plan, a programme or a policy whose implementation is likely to have significant impact on the environment, its impact must be investigated and assessed to the necessary extent. For urban planning, regional and master plans, corresponding obligations are included in the Building Act. The EIA Act empowers the Council of State to issue general guidelines for this purpose; these guidelines were adopted in 1998 /3/. Government guidelines for environmental assessment of Regional Development Plans were issued in 1999, based on pilot studies made from 1995. The Road Administration took up SEA for its 4-year Action and Finance Programme in 1996 and is applying SEA to its Long Range Plan 2015.

The *Nordic Triangle* is the traffic network connecting the Nordic capitals to each other. In Finland, the Nordic Triangle is formed by the Turku-Helsinki-Vainikkala railway and its connections to essential harbours, the E18 highway, the most important south coast harbours, Helsinki-Vantaa airport and subsidiary functions. In 1995, the Ministry of Transport and Communications formed a task force to assess the environmental impact of the Nordic Triangle transport projects in Finland. The task force was to study and assess traffic development, development alternatives and environmental impacts of the alternatives. This was the first Finnish broad range transport corridor development impact assessment /4/.

The task force formulated four road and railway investment alternatives, with different transport policy aims, and evaluated their most important positive and negative consequences. Starting with a traffic impact study, the evaluation looked at impacts on the national economy, regional and urban structure, the natural and cultural environment, well-being, groundwater protection, energy use, emissions and traffic safety. The time period studied extended to the year 2010.

In 1997-98, a SEA was made for the *Helsinki Metropolitan Area Transport System Plan*. The assessment was conducted for the year 2020 and it examines the impacts of three different transport system alternatives on traffic and mobility, land use and environment as well as social impacts.

NORWAY

The Norwegian legislation on EIA was adopted in 1990, as part of the Planning and Building Act. SEA legislation has not yet been introduced, but a Government directive stipulates environmental assessment of law proposals, official studies and other official documents.

E18 Vestkorridoren is the most important transport connection from Oslo to the west. Planning started in 1989; a final project report was presented in 1996. Based on a 1991 motorway project EIA program proposal of the road administration, it was decided to include rail and public transport in the assessment. The new assessment programs were adopted in 1993, for the Road Administration and in 1994, for the Rail Administration. Phase 1 of the shared impact assessment was adopted in 1995. The second phase, including development of master plans for the alignments, ended in 1997 for rail and in 1999 for road connections. In all, five separate official hearing and adoption processes took place, showing the need for a co-ordinated assessment process from the beginning.

The *Norwegian Road and Road Transport Plan 1997* included a pilot SEA. The plan is based on development of four strategies, a mobility strategy, an environmental strategy, a transport safety strategy and a regional policy strategy. The key indicators for the environmental strategy are

- reduction in noise exposure
- reduction in air pollution exposure with regard to NO_x and PM₁₀
- reduction in number of km of trunk roads in significant conflict with landscape qualities and the natural and cultural environment. /5/

The experience gained in this process will be the basis for the National Transport Plan 2002-2011, taking up all modes of transport.

SWEDEN

In Sweden, stipulations on assessment are included in the guidelines for the plans and programmes as defined by Government directives for, among others, regional transport plans, national rail trunk network plans and national road plans. The Road Administration manual for Environmental Impact Assessment of Roads (1992/95) defines the basis for impact assessment of regional and national road and transport plans /6/. The Planning and Building Act includes stipulations on impact assessment of master plans since 1996.

The first environmental impact assessments were made by researchers in the '70s, among them an assessment of the Öresund fixed link between Sweden and Denmark.

The Road Administration developed its strategic planning and impact assessment in the mid-'80s, co-operating with the Rail Administration in regard of prediction methods &c. In the early '90s, the Road Administration was given the task of developing an environmentally adapted transport system for the Swedish part of the Öresund region.

The first *national and regional road transport plans* which included an environmental assessment concerned the period 1994-2003. For the 1998-2007 period, the Government asked the Nature Protection Agency, the National Archaeology Agency and the Housing Administration to develop, together with the

transport administrations, a methodology for strategic environmental assessment and for assessing impacts on the natural and cultural landscape in transport planning, as well as to evaluate the methodologies used in the 1998-2007 plans.

The *Parliamentary Communications Committee* used an expert group to take up environmental aspects as the work progressed. Documentation on environmental impacts was included in every part of the Committee's 1997 proposals.

In 1998, the pilot study on the *Gothenburg-Jönköping transport corridor* was published by the Road Administration /7/. The study was made in the framework of EU development of guidelines for environmental assessment of the TEN. The report on environmental, economic and traffic safety aspects is intended to serve further discussion. Gothenburg and Jönköping are linked by main road 40. There are no direct train links. Main road improvement has been proposed mainly for traffic safety, while the Rail Administration has proposed a new regional rail link from Gothenburg.

In the study, eight alternatives were assessed for the period up to the year 2020, from the Zero+Zero alternative, with no new rail connections and no improvement to the road, to Mv+Glb, with a motorway and a new rail link Gothenburg-Jönköping. The environmental impacts were studied for a 45x90 km zone along main road 40. The impacts were assessed in regard of how the alternative would support implementing environmental goals, the need for specific mitigation measures and environmental conflicts remaining after these measures.

The 1997 proposal for a new *master plan for the City of Lund* is an example of a development and land use plan including integrated assessment of economic aspects, transport aspects, social aspects and environmental aspects. The environmental assessment is based on national, regional and local environmental goals and objectives.

2 SHARED EXPERIENCES, COMMON PROBLEMS

In environmental assessment on the strategic level, especially concerning policies, the spheres of political decision-making and expert evaluation interact in a very complicated manner. The role of the assessment is coloured by this interaction. In some countries, the assessment procedure is emphasised as part of the administrative and political process, and the result of the assessment is a matter of political acceptance. In others, the emphasis is on sustainability and relating the policy to long range environmental goals. In the Nordic countries, the procedural emphasis has traditionally been strong. But as national environmental goals and implementation of international conventions on the environment emerge, the trend is towards linking assessment ever more closely to these goals. The assessment shows if the policy, programme or plan contributes towards the goals and what more needs to be done towards the goals.

Despite differences in legislation, SEA implementation has proceeded in a similar manner in these countries. Pilot assessments have been used to develop guidelines, which in their turn give rise to new pilots. SEA methodology is still developing and comprehensive implementation still rare. On the other hand, this development through generations of pilot assessments does point to the complex nature of SEA. Successful SEA is integrated into the policy, planning and decision-making process in a manner which does not give much room for "standardisation".

THE LEVELS OF ASSESSMENT

Early descriptions of SEA relied strongly on transferring EIA techniques to the strategic level. The present picture is much more differentiated. For planning close to projects, for instance single transport corridors, the similarities are notable, but further towards the policy field, differences increase. Some notable aspects are:

1. On the strategic level, a crucial question for decision-makers is balancing the objectives of, for instance, mobility, safety, environment and economy. This turns SEA into an overall assessment of the interaction of all these objectives and separate environmental assessment reports or separate decisions on environmental impacts are hardly possible.
2. Though there are different levels in strategic planning, it is not really hierarchical and cannot usually be divided into any clear tiers. The process is iterative, moving back and forth between levels and stages.
3. There is a distinction between plans taking up physical/geographical solutions, typically land use plans, and programmes dealing with timing, financing or links of actions. Programmes ask “how” and “when”, physical plans “what” and “where”. Programmes are often closely bound to specific sectors, while plans take up all sectors for a specific area. This leads to clear differences in the aims of the assessment and the methodology applied.

Building on the distinction mentioned above, one can formulate the following scheme of Nordic SEA application:

PROCEDURE	LEVEL	EXAMPLES:	
		“when-how”	“where-what”
1 Strategic Impact Assessment environmental aspects as a part of a comprehensive set of objectives	Policy level Policy time scale approx. 25 years, assessment 35 years or more	Transport policy Environmental policy	Regional development programmes and plans
2 Strategic Environmental Impact Assessment the different modes of transport assessed together	Corridor and network level Planning time scale approx. 15 years, assessment 20+ yrs	Transport corridors Transport system plans	Land use plans (master plans)
3 Programme assessment each sector for itself	Action plans For instance 4-year plans and programmes	Sector action and finance programme	Environmental action plans, traffic safety programmes (if they contain localised action proposals) Local land use plans (town plans)

A fourth group consists of Government proposals for legislation, which are assessed as part of the Parliamentary procedure. There are guidelines for this assessment, but as yet few examples comparable to the Danish State Budget Assessment or the work of the Swedish Communications Committee. To some

extent, the “when-how” programmes of group 3, above, and most legislative proposals are problematic from the SEA point of view. Even though almost all choices and actions at this level can be seen to have significant environmental impacts, it is very difficult to identify such impacts for laws or programmes that do not have the specific physical frame of reference of a localised plan or action on a defined area.

A conclusion drawn in Sweden is that SEA should concentrate on the long range network plans and policies specifying, for instance, which kind of infrastructure or transport management action is proposed for a given region. Once this is clear, the impacts of, say a financing decision to build something sooner or later, are comparatively minor and generally also temporary. At Finnra, we feel that a more productive approach than SEA to the programme and legislative level can be Life Cycle Assessment (LCA), seeing a 4-year programme as a stage in the life cycle of road management and asking how this process – for instance its emissions – can be better adapted to the environment.

THE SLIGHTLY DUBIOUS PROFITS OF COMPUTERISATION

SEA techniques have mainly been developed in corridor studies, later to be applied to transport networks. The availability of computerised geographical information databases has been a crucial step towards enlarging the scope of the assessment. GIS has led to a revival of assessing zones of vulnerability or cumulative environmental risks, originally developed in the ‘60s. As computer capacity grows, the number of factors taken up and the size of the areas studied also grow. But this also brings risks.

One of these is that control over data reliability is lost, as the data base is normally produced by a number of different organisations, and the amount of data complicates tracing the source of, say, a dubious nature protection area boundary. Data costs also tend to increase radically, while the results, as the number of factors increase, seem to lose their focus. In the end, there remains the general conclusion that in comparing networks, the longer network usually is the one that creates the most environmental problems. By this definition, roads are more problematic than railroads – which perhaps could be guessed at even without a very thorough assessment.

There is also a grave risk that only impacts which can be quantified, either in economical terms or as index points on a map, will be taken up in the assessment. There is often a dichotomy in the guidelines, which start off by emphasising the need to focus on qualitative assessment, but use most of the space for presenting quantitative techniques. Quantitative assessment works fairly well when comparing similar alternatives, but if there are differences in principle, or a possibility of shifts in paradigms, measurement becomes nearly useless. It is in the nature of strategy to deal precisely with alternatives which are not easily compared by measurement and with a long-range time scale, where paradigm shifts are almost inevitable.

To avoid such risks, it is useful to consider the following motto: “The art of SEA is to limit the elaboration of the transport infrastructure plan and its assessment to what is absolutely necessary for the decision to be made” /8/. The fact that a tool such as computers exists does not imply an obligation to use it. Any kind of impact data or evaluation summary can be calculated, but only those calculations that are clearly relevant for the decision to be made have any use. Confused links to the decision-making process can lead to a lack of focus, which in its turn produces a flood of “information” on a plan or programme and its many possible impacts, but very little knowledge for those who are to decide.

SEA AND DECISION-MAKING

There is as yet little evidence that SEA would have succeeded in influencing decision-making to a significant degree. Lack of focus may be a contributing factor. One essential development is the growing link to national environmental and sustainability goals, referred to earlier.

Only if the decision makers are committed to these goals, can they be expected to base their decisions on attaining sustainability and only if the assessment clearly shows the degree of attainment in the plan or policy proposed, can they be expected to make a relevant decision.

The commitment of decision-makers is to some degree a function of the level of political debate about and public interest in environmental matters. Debate and interest presupposes understanding and this can only arise if people can comprehend the process and feel that it concerns them. "Public participation at the strategic level poses special challenges. Few of the examined cases have included extensive public participation or systematic grass roots consultations. Instead various forms of representative hearings have been used. None of the cases have provided innovative examples of public participation." /9/

In the pilot studies, public involvement has seldom been considered necessary; they have, rather, focused on co-operation between agencies and administrations. In hindsight, one might feel that developing public involvement should have been one of the main topics of the pilots, because this is one of the most complicated problems of strategic assessment. Public participation may be the crucial issue determining whether SEA can serve decision-making for sustainability.

One reason for the slow progress in this field may be the perception of a possible conflict between a participatory strategic planning system and the traditional institutions of representative democracy. If people participate directly in making policy, what role is there for those who have been elected to represent them in decision-making? At present, two ways out of such a dilemma have been shown:

- if national strategic planning is given a firm legislative foundation, with the policies and plans taken up in Parliament, say every four years, politicians and others know what to expect and the risk of conflicting processes is very small
- on the regional and local level, the procedures of land use planning offer an existing framework for SEA, and these plans are also a natural basis for assessing the long term impacts of a specific network, such as transport, which interacts in many ways with all other land use.

For instance in Finland, Parliamentary Committees have taken up transport policy, but strategic planning has developed on an ad hoc basis, and this has caused some confusion, because of uncertainty about how these plans connect to the intentions of Parliament. But integration in regional planning has been fairly successful, and the link to local authority master plans is improving.

For Iceland (which was not included in the NVF study), it has been concluded that "the most meaningful approach to increase environmental concerns may be to improve the existing land use management processes, by using selected EIA/SEA techniques. Land use planning is very broad in scope, yet so is SEA...It is therefore suggested that environmental assessment becomes part of the planning process and SEA would thus be viewed as a planning tool, not an institutionalised process of itself." /9/

3 THE TRENDS OF TRANSPORT SEA

As SEA implementation progresses, some general trends can be seen. Originally, SEA was considered a generalised variant of EIA, but the integration of environmental concerns into the strategic process has led to a much more complex view. Rather than being an assessment of a given policy, programme or plan, SEA is part of the making of such a plan. In this way, SEA will have a significant impact on strategic decision-making, but this demands a clear link, and, for the decision makers, a commitment to national sustainability goals. Co-operation with the public is essential, but also very difficult, and there is a risk that SEA will fail in this respect.

There is a continuous development of assessment methodology. For some time, its focus has been on computer tools, such as data bases, models, prediction methods and decision support, but emphasis is shifting to such societal concerns as:

- focusing SEA on significant and relevant aspects
- the interaction of environmental, social and economic impacts
- reaching the public
- handling uncertainty.

Transport SEA means dealing with all transport modes together, infrastructure and non-infrastructure measures together and linking the sector intimately to other sectors. Its main focus is on transport corridor assessment and on network assessment. On the local and regional level transport SEA is increasingly integrated with and performed as a part of the land use planning process.

REFERENCES

In these references, only publications in English are listed, except for /1/. The national publications referring to the cases presented here can be found in the source list of /1/. An overview of Nordic SEA experience is presented in /9/. Further information can be accessed through the Nordic EIA network maintained by the Nordregio Institute (<http://www.nordregio.a.se>).

/1/ Nordisk Vegteknisk Forbund: Strategisk miljøkonsekvensbedømmning i transportsektorn, rapport fra arbeidsgruppe; NVF 1/99 (Nordic Road Association, Strategic Environmental Assessment in the Transport Sector)

/2/ Strategic Environmental Assessment of National Policies: the Danish Experience of a Full Concept Assessment; Bo Elling, in Project Appraisal, volume 12, number 3, September 1997

/3/ Guidelines for the Environmental Assessment of Plans, Programmes and Policies in Finland; Ministry of the Environment, 1998

/4/ Environmental Impact Assessment of the Nordic Triangle; Finnish Ministry of Transport and Communications, Publications L 11/96

/5/ What Type of Strategic Planning?; Tor Lerstang, Presentation at the 14th International Symposium on Theory and Practice in Transport Economics, ECMT 1997

/6/ EIA for Roads – Manual; Swedish National Road Administration Report 1995:30

/7/ The Gothenburg-Jönköping Corridor, Environmental Impact of Strategic Choice; Swedish National Road Administration Report 1998:62

/8/ Manual on Strategic Environmental Assessment of Transport Infrastructure Plans; European Commission, DG VII Transport, February 1999

/9/ EIA and its Application for Policies, Plans and Programmes in Sweden, Finland, Iceland and Norway; TemaNord Environment 1998:567, Nordic Council of Ministers, Copenhagen 1998