



# BEACON

**B**uilding  
**E**nviromental  
**A**ssessment  
**CON**sensus

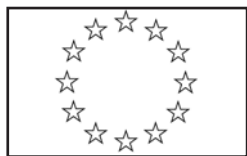


European Commission, DG TREN

# **THE SEA MANUAL**

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A SOURCEBOOK ON STRATEGIC  
ENVIRONMENTAL ASSESSMENT OF  
TRANSPORT INFRASTRUCTURE  
PLANS AND PROGRAMMES



EUROPEAN COMMISSION  
DIRECTORATE-GENERAL FOR ENERGY AND TRANSPORT

DIRECTORATE B - Transeuropean Networks Energy & Transport  
Head of Unit

Decision 884/2004/EC, amending Decision 1692/96/EC on "Community guidelines for the development of the Trans-European transport network" establishes (article 8) that "When projects are planned and carried out, environmental protection must be taken into account by the Member States" and that "As from 21 July 2004 an environmental assessment of the plans and programmes leading to such projects, especially where they concern new routes or other important nodal infrastructure development, shall be carried out by Member States pursuant to Directive 2001/42/EC of the European Parliament and of the Council".

The Decision further specifies that "the Commission shall, in agreement with Member States, develop suitable methods for implementing the strategic environmental assessment with the objective of ensuring, inter alia, appropriate coordination, avoiding duplication of effort, and achieving simplification and acceleration of planning processes for cross-border projects and corridors".

In this context, the BEACON project (funded within the establishment of a discussion and consultation platform of Strategic Environmental Assessment (SEA)), was initiated by the Commission in 2003.

One of the main outcomes of the BEACON project is the new version of the Transport SEA Manual, which is a substantial re-elaboration of the previous version issued by DG TREN in 1999 (i.e. before Directive 2001/42/EC).

The drafting of the present Manual has benefited from an extensive exchange of information between public stakeholders and relevant services of the European Commission (DG TREN, DG ENV, DG REGIO) and input has been received from experts in both, the public and private sectors. In October 2005, the Manual was presented and discussed in the TEN-T Committee, composed of representatives from the Ministries of Transport of the Member States of the European Union, where it was well received.

Brussels, 31 October 2005

Edgar Thielmann

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## **Acknowledgements**

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We also gratefully acknowledge the contribution of all the experts and Member States representatives that have participated to the BEACON workshops and final conference.

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## PREFACE

This Sourcebook aims at giving support to those involved and/or interested in strategic environmental assessment (SEA) processes in transport plan and programme making within the relevant policy frameworks. It aims at a wide readership in all EU member states. Therefore, it is written in a generic manner, revolving around the effective implementation of the Directive on the assessment of the effects of certain plans and programmes on the environment (2001/42/EC), or in short 'SEA Directive'. In this context, and in the spirit of the Directive, the Sourcebook does not only elaborate on the procedural stages to be followed and impacts to be addressed, it also explores the right context conditions for the effective application of SEA, the tasks to be fulfilled in specific strategic situations and the use of suitable methods and techniques. The Sourcebook works on the assumption that SEA does not only aim at providing planners and decision makers with relevant information on environmental aspects in strategic planning and decision making, but that it also strives at functioning as an instrument for social learning among those involved in strategic planning and decision processes through participation and involvement. Ultimately, it is hoped that this may influence organizational culture, leading to greater environmental awareness and more environmentally sustainable decisions.

The sourcebook includes three main Sections and a set of Fact Sheets. This format is intended to make this resource easy to use and readily

updated and integrated through new fact sheets as new issues arise. These can be read in logical sequence, starting with the presentation of general concepts, rationale, scope and objectives of SEA, then proceeding to the illustration of the overall structure of the SEA process, followed by the detailed description of each of the individual SEA tasks, and finally presenting practical and operational information drawn from examples and previous experiences.

However, the Sourcebook has been drafted in such a way that each section is self-contained, so that the reader can focus on his/her specific interest.

Section 1 introduces SEA and presents a set of critical issues relating to SEA interpretation and application. Furthermore, context conditions, enabling the effective application of SEA are introduced. It also provides a concise outline of the SEA Directive. Section 2 shows how the SEA process should be integrated into the decision making process and how it should be managed to achieve the expected results. Section 3 illustrates in a more detailed way how to set up and carry out the main SEA process tasks, from screening to monitoring and implementation. Most of the contents highlighted in this third Section are then further developed into fact sheets, providing users and operators with issues and aspects on which they need specific orientation, clarification, tools, technical help, or any other kind of assistance.

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**SECTION 1:**  
**INTRODUCING SEA AND ITS CRITICAL ISSUES**

**Main focus:**

**What is SEA?**

**SEA and Project EIA**

**The European Directive on SEA**

# 1. INTRODUCING SEA AND ITS CRITICAL ISSUES

Read this chapter to get an overview of the principles that make Strategic Environmental Assessment different from Environmental Impact Assessment.

## 1.1. WHAT IS SEA?

### Definition, rationale and function of SEA

Strategic environmental assessment (SEA) is a systematic, pro-active and participative process that aims at ensuring that environmental aspects are given due consideration in planning and decision making above the project level, frequently referred to as 'strategic action' or 'policies, plans and programmes (PPPs)'.

SEA supports the development of more rigorous and transparent strategic decisions, attempting to provide relevant and reliable information to those involved in PPP making in an effective and timely manner. SEA can take different forms, depending on, for example, the sector (e.g. land-use, transport, energy, waste, water), the administrative level (e.g. national, regional, local) and the strategic tier (e.g. policy, plan and programme) it is applied to. SEA of highly strategic (and political) decisions, has been shown to function in a rather different way from SEA applied to planning led by public or private administrations. Whilst certain key elements will be reflected in every SEA system, others will differ, reflecting different planning and assessment traditions and practices, as well as political and cultural traditions of the organisations responsible for PPPs and associated SEA.

SEA in the transport sector is conducted at different administrative levels of decision making. Furthermore, in many European countries, transport SEA has been observed to take place at various, hierarchical tiers (see Figure 1-1<sup>1</sup>; and, for additional insights on the tiering concept, refer to the Fact Sheet 4.3: The concept of Tiering in Transport SEA):

- a. SEA in **high level** decisions: assessing strategic options in a cross-sectoral manner with respect to the achievement of overall environmental and broader sustainability aims and objectives
- b. SEA in **plan** making decisions: evaluating network and corridor options in terms of an overall identified need

- c. SEA in **programme** making decisions: ranking of possible infrastructure projects in terms of benefits and costs

In practice, in developed transport systems, decision tiers neither work in a strict top down manner, nor are they always considered separately from each other. Feedbacks are possible from lower to higher tiers and are necessary from higher to lower tiers. Strategic decision making processes work most effectively as iterative processes and accordingly, SEA itself ought to follow patterns of iteration (see for example the German Federal Transport Infrastructure Plan<sup>2</sup>). Furthermore, transport planning documentation at times combines the presentation of policy related decisions with plan and/or programme related decisions (for example the Dutch Second Transport Structure Plan and regional transport plans<sup>3</sup>)

In this context, it is crucial to recognise that terminology is not always used in a systematic manner and what is called a 'plan' in one sector might look very similar to what is called a 'programme' in another. Different terms might have different meanings in different cultural contexts. Policies, for example, might be referred to as 'strategies', 'visions' or 'concepts'. Furthermore, the terms 'plans' and 'programmes' may be used interchangeably or be replaced by other terms. Whilst this inconsistent use of terminology is a reality, it has been leading to some substantial confusion among those involved in SEA. Therefore, in this Sourcebook, an effort has been made to

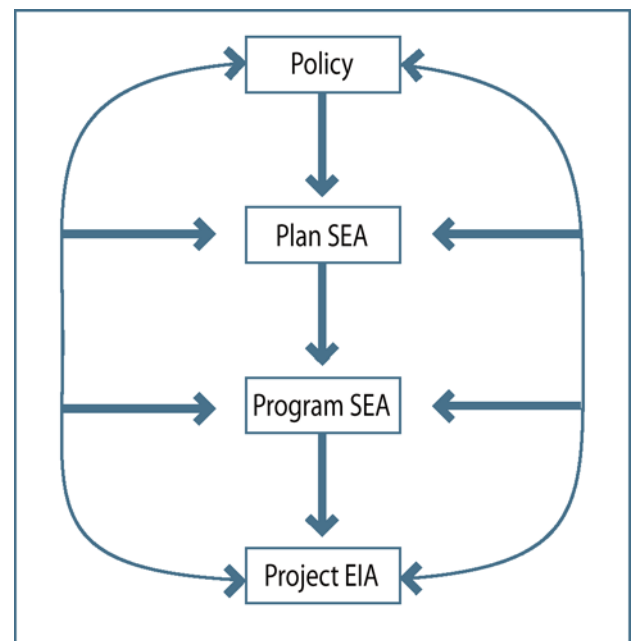


Fig. 1 1: Tiers of planning and related environmental assessments

use the various terms in a more systematic and rigorous manner. Terminology is explained in the glossary.

<sup>1</sup> Following Jansson, 2000; Fischer, 2000; van Straaten et al, 2001 and Bina, 2001

<sup>2</sup> Dalkmann and Bongardt, 2004

<sup>3</sup> Fischer, 2004

## Box 1 1: Proposed definitions for Policies, Plans and Programs

According to Wood (1991), a **policy** can be defined as an inspiration and guidance rationalising the course of action of a government, for example the development of a High Speed Rail (HSR) network to promote the shift of passenger traffic from air or road to rail. A **plan** can be defined as a set of linked proposed actions - with a time frame - to implement the policy, such as where and when to implement the HSR network(\*). Finally a **programme** can be defined as a set of **projects** that specify the geographical and temporal design criteria of the plan objectives, for instance the proposal to develop a HSR track to connect two or more cities by a given year.

(\*Although plans normally include a time frame, a plan can still be subject to the SEA directive even though it contains no time frame

In the European Union, SEA Directive 2001/42/EC, cited throughout this Sourcebook as the 'SEA Directive' (see paragraph 1.2), lays down the principles, methods and fields of application of SEA. The SEA Directive addresses Member States and explicitly refers to 'plans and programmes'. Accordingly, the Sourcebook therefore focuses on these two decision making tiers. On the other hand, the basic principles of SEA could also be adopted for higher level decisions.

### Benefits of SEA

If applied in the right way, a range of benefits may result from SEA application. Actually, SEA does not only aim at supporting an environmentally sound and sustainable development, it also attempts to **strengthen strategic processes, improving good governance and building public trust and confidence in strategic decision making**. Ultimately, SEA can lead to saving time and money by avoiding costly mistakes. Benefits arise from SEA, based on the following characteristics (adapted from Fischer, 2002):

- a. SEA allows for a wider consideration of impacts and alternatives with respect to e.g. EIA.
- b. SEA plays as a pro-active tool and can thus be used to support the formulation of strategic action for sustainable development.
- c. SEA can increase the efficiency of tiered decision-making (including strengthening of Project EIA).
- d. SEA allows for a systematic and effective consideration of the environment at higher tiers of decision-making.
- e. SEA entails more consultation and participation of the public.

## 1.2. SEA AND PROJECT EIA

The main difference between SEA and project EIA is linked to the type of decision which they are meant to assess. **EIA** is associated with **project** decisions, usually the final decisions before construction work is started. These are detailed decisions, notably concerned with the location and design of a project and with the adoption of measures to mitigate, rather than prevent, environmental impacts. Feasible alternatives at the project stage are often limited to minor variants.

**SEA**, on the other hand, is associated with decisions on, for example, demand management options, modal solutions or different routes. SEA may therefore influence decisions on need, mode and location of transport infrastructure projects and, subsequently, the scope of project EIA. An important feature of SEA is that it allows to evaluate impacts on the transport flows of a region or even a country and their associated effects. In this context, SEA relies on using appropriate forecasting methods.

Two examples may be used to clarify what this means, namely the construction of a new high-speed rail (HSR) line and the construction of new road infrastructure. A new HSR line may attract traffic from parallel highways or contribute to mitigate airports congestion. Conversely, the increased attraction capacity generated by new road infrastructure may lead to creating bottlenecks that are not foreseeable at project level. Finally, cumulative effects can most readily be appreciated at the SEA level. Figure 1-2 shows the main differences between SEA and project EIA.

	SEA	EIA
<b>Decision making level</b>	Plan Programme } within the relevant policy framework	Project
<b>Nature of action</b>	Strategic, visionary, conceptual	Immediate, operational
<b>Outputs</b>	General	Detailed
<b>Scale of impacts</b>	Macroscopic, cumulative, not defined	Microscopic, localised
<b>Time scale</b>	Long to medium term	Medium to short-term
<b>Key data sources</b>	Sustainable development strategies, state of the environment reports, visions	Field work, sample analysis
<b>Type of data</b>	More qualitative	More quantitative
<b>Alternatives</b>	Area wide, political, regulative, technological, fiscal, economic	Specific locations, design, construction, operation
<b>Rigor of analysis</b>	More uncertainty	More rigor
<b>Assessment benchmarks</b>	Sustainability benchmarks (criteria and objectives)	Legal restrictions and best practice
<b>Role of practitioner</b>	Mediator for negotiations	Advocator of values and norms Technician, using stakeholder values
<b>Public perception</b>	More vague, distant	More reactive (NIMBY)

Fig. 1 2: Main differences between SEA and EIA

Source: adapted from Partidario and Fischer, 2004

### 1.3. THE SEA DIRECTIVE CONTENT, OBJECTIVES AND PURPOSES

The enunciates illustrated in paragraphs 1.1 and 1.2 form the pivotal concepts on which the SEA Directive 2001/42/EC has been built upon to substantially differentiate it from the previous EIA Directive 85/337/EC. It is then worth highlighting the main concepts of the SEA Directive in this introductory Section of the Sourcebook, outlining objectives, scopes and the main content issues.

The SEA Directive 2001/42/EC entered into force in July 2001 (Official Journal L 197). Art. 13 of the Directive obliges the Member States to implement the contents of the Directive by July 21st 2004. In practice this means that the SEA Directive should be applied to plans and programmes whose formal preparation begins after 21 July 2004 and also to those which were already in preparation by that date but were not to be adopted or submitted to a

legislative procedure before 21 July 2006. The first Commission's report on the application and the effectiveness of the SEA Directive must be submitted to the European Parliament and the Council before 21 July 2006.

#### Overview and contents:

The provisions of the SEA Directive are mainly of a procedural nature. This means that the Directive rules the procedural steps, requirements and consequences. Most of these provisions concern the SEA procedure, starting from the screening and ending with the monitoring (see chapters 5-10). Only in few cases the Directive assigns substantial rights to a natural or juridical person or to any other body. Participation and consultation rights deserve a particular attention in this context.

The SEA Directive consists of 15 articles and two

annexes:

- Art. 1 describes the objectives of SEA.
- Art. 2 provides the definition of relevant terms.
- Art. 3 identifies the area of application.
- Art. 4 to 9 rule the SEA procedure proper.
- Art. 10 defines the monitoring process.
- Art. 11 addresses the relationships of SEA with other relevant European legislative acts, notably the EIA Directive.
- Art. 12 regulates information, reporting and review obligations of both the European Commission and the Member States.
- Art. 13 consists of provisions on the transposition of the Directive by Member States, to which the Directive is addressed in Art. 15.
- Art. 14 rules the entry into force with publication in the Official Journal.
- Annex I identifies the information referred to in Art. 5 paragraph 1, the environmental report.
- Annex II sets out criteria for determining the likely significance of effects

### **Objectives**

The objective of the SEA Directive, described in Art. 1, is "to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development". These aims are consistent with the general objectives of the Community policies on sustainable development as laid down in the EC Treaty. The Directive requires environmental assessments to be carried out for a range of plans and programmes likely to have significant effects on the environment.

The Directive defines "environmental assessment" as a procedure that entails the following tasks:

- preparing an Environmental Report on the likely significant effects of the draft plan or programme;
- carrying out consultation on the draft plan or programme and the accompanying Environmental Report;
- taking into account the Environmental Report and the results of consultation in decision making; and
- providing information when the plan or programme is adopted and showing how the results of the

environmental assessment have been taken into account.

### **Scope of the Directive**

The purpose of the SEA Directive is to ensure that environmental consequences of certain plans and programmes are identified and assessed during the preparation stage and before they are adopted.

The plans and programmes which fall within the scope of the Directive are those

- which are subject to preparation and/or adoption by an authority at national, regional or local level, or are prepared by an authority for adoption through a legislative procedure by Parliament or Government, and
- which are required by legislative, regulatory or administrative provisions.

The Directive makes SEA mandatory for plans and programmes:

- which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use and which set the framework for future development consent for projects listed in Annexes I and II to Directive 85/337/EEC (the "Environmental Impact Assessment (EIA) Directive"); or
- which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/EEC (the "Habitats Directive")

Member States must determine whether certain plans and programmes are likely to have significant environmental effects and hence whether environmental assessment is required. These are:

- plans and programmes within the core scope set out in the paragraph above that either
  - determine the use of small areas at local, and/or entail
  - minor modifications to plans and programmes within this core scope
- any other plans and programmes outside this core scope which set the framework for future development consent of projects

A screening process is needed to carry out this determination. Screening can be carried out by means of a case-by-case examination, or by specifying types of plans and programmes, or by combining these two approaches.

Annex II of the Directive lists criteria for determining the likely significance of the environmental effects of plans or programmes, and these must be taken into account in the screening process.

The SEA must be carried out during the preparation of the plan or programme and before its adoption or submission to a legislative procedure.

### **Exemptions**

The Directive does not apply to:

- plans and programmes the sole purpose of which is to serve national defence or civil emergency
- financial or budget plans and programmes
- plans and programmes co-financed under the respective programming periods for Council Regulations EC 1260/1999 and EC 1257/1999 (programming periods end in 2006 or 2007)

### **Who should do the SEA?**

The Directive does not prescribe who should carry out the SEA, but it is envisaged that it will normally be the responsibility of the authority that produces the plan or programme.

### **The Environmental Report**

The Environmental Report is a key element of the environmental assessment required by the Directive. Where SEA is required, an Environmental Report must be prepared in which the likely significant environmental effects of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated.

The information to be included in the Environmental Report is listed in Annex I to the Directive and includes, among other things:

- the environmental protection objectives relevant to the plan or programme;
- the relevant aspects of the current state of the environment (i.e. without implementation of the plan or programme);
- the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape, and the interrelationship between these factors;
- the mitigation measures envisaged; an outline of

the reasons for selecting the alternatives dealt with; monitoring measures envisaged;

- a non-technical summary of the information under all the headings in Annex I.

The process of preparing the Environmental Report should start as early as possible and, ideally, at the same time as the preparation of the plan or programme. The preparation of the Environmental Report and the integration of the environmental considerations into the preparation of plans and programmes form an iterative process that contributes to more sustainable solutions in decision making (see chapter 3).

The Environmental Report should be made available at the same time as any draft plan or programme, as an integral part of the consultation process, and the relationship between the two documents should be clearly indicated.

### **Consultation**

The Directive requires that the public, and also the authorities likely to be concerned by the environmental effects of implementing the plan or programme owing to their environmental responsibilities, are consulted as part of the SEA process. The purpose of this is to contribute to more transparent decision making and to ensure that the information supplied for the assessment is comprehensive and reliable. Appropriate time frames should be set for consultations, allowing an effective opportunity for consultees to express their opinions.

The Directive requires consultation in the following circumstances:

- As part of the screening procedure referred to above (see 'Scope of the Directive' and 'Exemptions'), the authorities with environmental responsibilities must be consulted. These authorities have to be designated by Member States.
- Those same environmental authorities must be consulted when deciding on the scope and level of detail of the information to be included in the Environmental Report.
- The draft plan or programme and the Environmental Report must be made available to the environmental authorities and to the public. The environmental authorities, and the public likely to be affected or with a particular interest in the environmental effects of implementing the plan, must be given an early and effective opportunity to express their opinions.
- Provision is also made for transboundary consultations with other EU Member States if their environ-



ment is likely to be significantly affected by the plan or programme.

After responses to the consultation have been received from the public, from the authorities with specific environmental responsibilities, and from other countries where these have been consulted, the Directive requires them to be taken into account during the preparation of the plan or programme and before its adoption or submission to a legislative procedure.

### ***Decision Making***

When a plan or programme is adopted, the environmental authorities, the public and any other Member State consulted must be informed. The following items have to be made available to those so informed:

- the plan as adopted;
- a statement summarising how environmental considerations have been integrated into the plan, how the Environmental Report and the opinions expressed on it have been taken into account, and the reasons for choosing the plan as adopted in the light of other reasonable alternatives dealt with; and
- the measures adopted concerning monitoring.

### ***Monitoring***

The significant environmental effects of the implementation of plans and programmes must be monitored to identify any unforeseen adverse effects and to enable appropriate remedial action to be taken. Monitoring allows the actual effects of the plan to be tested against those predicted in the SEA and helps to ensure that problems which arise during implementation, whether or not they were originally foreseen, can be identified and future predictions made more accurately. It can also be used to provide baseline information for future policies, plans or programmes.



**SECTION 2:**  
**THE APPROACH TO SEA:**  
**PRINCIPLES FOR INITIATING AND MANAGING EFFECTIVE SEAS**

**Main focus:**

**SEA: a participatory and integrative approach**

**Setting out the SEA Process**

**Managing the SEA Process**

## 2. PRINCIPLES AND RULES FOR MANAGING AN EFFECTIVE SEA

### Main focus:

- SEA: a participatory and integrative approach
- Setting out the SEA Process
- Managing the SEA Process

Read this chapter for an overview of the steps in the SEA process

### 2.1. THE APPROACH TO SEA: PARTICIPATORY AND INTEGRATIVE

#### 2.1.1 The 'SEA steps'

The SEA Manual issued by DG TREN in 1999 described the SEA process as a sequence of 7 steps, namely:

#### 2.1.2 Distinguishing between 'SEA steps' and 'approach to SEA'

The revised version of the SEA Manual, while recognising the relevance and importance of each of the above components, introduces important innovations:

- it recognises the complexity of the SEA process, entailing multiple feedbacks and iterations;
- it highlights the importance of consultation, cooperation and participation, and;
- it considers integration as a central characteristic of SEA processes.

In doing so, the Sourcebook intends to acknowledge that

<b>Screening:</b>	Is SEA necessary?
<b>Scoping:</b>	<ul style="list-style-type: none"> <li>• What are the transport / environmental objectives of the infrastructure plan?</li> <li>• Which issues should be discussed in the assessment?</li> <li>• Which assessment method is feasible with the available data?</li> </ul>
<b>Environmental Assessment</b>	<ul style="list-style-type: none"> <li>• How significant are the impacts?</li> <li>• How can these be reduced if necessary?</li> <li>• How should these be monitored after decision-making?</li> </ul>
<b>Review</b>	<ul style="list-style-type: none"> <li>• Is the report user-friendly and unbiased?</li> <li>• Are all the relevant issues, including alternatives, discussed?</li> <li>• Are the forecasts and the associated methods presented clearly?</li> </ul>
<b>Implementation and Monitoring</b>	<ul style="list-style-type: none"> <li>• Is it clear how the transport infrastructure plan is to be implemented?</li> <li>• Are proposals for monitoring set down clearly?</li> <li>• Is there a mechanism for correcting any unacceptable aspects of implementation?</li> </ul>
<b>Consultation and Participation</b>	<ul style="list-style-type: none"> <li>• Is there any plan for public participation?</li> <li>• Is there a procedure to interact with the authorities of another country in case of trans-boundary corridor?</li> </ul>
<b>Decision Making</b>	<ul style="list-style-type: none"> <li>• Is the SEA integrated into the planning process?</li> <li>• Is the SEA linked with other types of assessment?</li> <li>• Is the SEA fully considered in decision-making?</li> </ul>

## Box 2 1: What is meant by integration?

*Integration is typically intended in many different ways by a range of actors in the SEA and planning contexts. This Sourcebook focuses in particular on two closely related interpretations of the concept:*

Sectoral (and disciplinary) integration – whereby the environmental dimension and related concerns are integrated into mainstream transport thinking when formulating transport priorities, objectives and alternative strategies;

Process integration – whereby the process of assessment (with its different activities and stages) is designed to integrate with transport's planning and decision-making process. This second interpretation effectively implies the pursuit of sectoral integration.

- Five out of the seven SEA steps can indeed be considered as flowing in logical sequence: *Scoping* can only be carried out once the *Screening* is completed; *Assessment* is directly dependent on the *Scoping* outcome; *Review* applies to the SEA Report, which in turn illustrates the results of the *Assessment*; finally, *Implementation and Monitoring* follow the approval of the Plan or Programme for which SEA is carried out, and can therefore only take place once the 4 previous steps are completed. Feedbacks and iterations are expected to take place during this process, notably to account for the lessons learned from the *Assessment*, *Review*, and *Implementation and Monitoring*, possibly leading to changes and adjustments to the decisions previously made as a result of the *Screening* and *Scoping* steps. As illustrated in the relevant sections of this Sourcebook, explicit provisions must be made at the institutional and organisational level to allow for such iterations.
- *Consultation and Participation*, on the other hand, must be considered as a parallel, continuous process. As illustrated in this Sourcebook, extensive consultation with a wide range of stakeholders, including the general public, is critical to the success of SEA. It is a two-way process, where the primary objective is to elicit inputs from all concerned communities that may, and should contribute to

the decision making process all along the SEA exercise. *Consultation and participation* must begin from the very early stages of SEA and continue throughout its elaboration. It is therefore suggested that *Consultation and Participation* is not represented as one of the SEA steps, but rather as a continuous, multi-event process, and a key feature of the approach to SEA promoted in this Sourcebook (see Figure 2.1).

- Finally, in this Sourcebook *Integration into Decision Making* is conceived primarily as an “approach”, rather than a “step”, or a task. In fact, the very wording “Integration into Decision Making” appears inappropriate, as it suggests that SEA is an autonomous process that must at some point be integrated in a pre-existing Decision Making process (see Box 2-1). This Sourcebook is rather based on the concept that SEA on the one hand, Transport planning and Decision Making on the other, must be integrated at the outset, each contributing to shaping the other.
- Figure 2-1 illustrates the steps and the participatory and integrative approach advocated in this Sourcebook (see also Figure 2.2). The participatory and integrative approach to SEA also provides support to a key feature of SEA: as it is also expressed through articles 1 and 4 of the Directive, it should improve the making of policies, plans and program-

## Box 2 2: A good example of integration

*Oxford Brookes University (2004) provides a good example for what concerns the improvement of an original objective for a transport strategy that was "to ensure the free flow of all forms of transport and improve the county's economic base whilst minimizing the environmental harm associated with transport". This objective was found problematic, as its pursuance might ultimately generate an increase in traffic, reduce environmental quality, whilst not necessarily improving people's ability to access necessary facilities or services. The new, improved objective formulation proposed as a result of the SEA process was: "to improve accessibility and reduce the need to travel"*

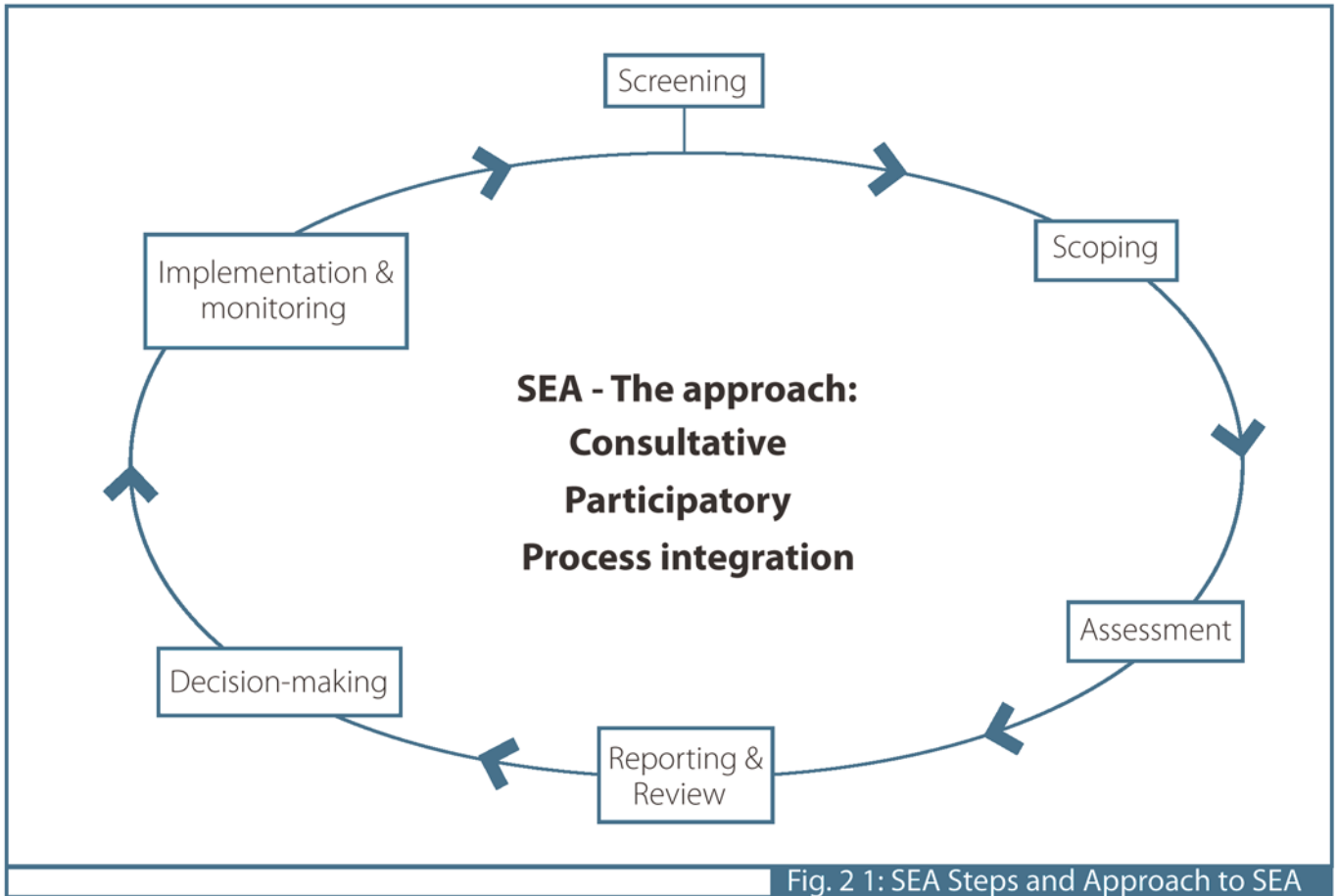


Fig. 2 1: SEA Steps and Approach to SEA

mes, rather than simply analyse them.

- Conducting a pro-active SEA process is instrumental to improving the quality of decisions. Figure 2-2 shows a good practice model, reflecting SEA Directive requirements, in which strategic decision making stages are linked to an SEA process in a continuous and integrated, decision flow. Here, SEA influences decision making right from the beginning, contributing to shape the objectives of the strategic action. If SEA is applied along such guidelines, it will be more likely to assist planners throughout the entire policy, plan and programme decision flow, supporting the consideration of environmental issues at each stage of the process.

Consultation and participation can take place at various stages of the process and experience has shown that this is one of the most important dimensions of SEA, capable of delivering both immediate and long term benefits in terms of greater cross-sectoral understanding, trust and collaboration. According to the SEA Directive, the results of the scoping activity (point B of Fig. 2-2) require the consultation of authorities with environmental responsibilities. Furthermore, the announcement of the draft plan and accompanying environmental report (point D of Fig. 2-2) requires the consultation of authorities with environmental responsibilities and the public.

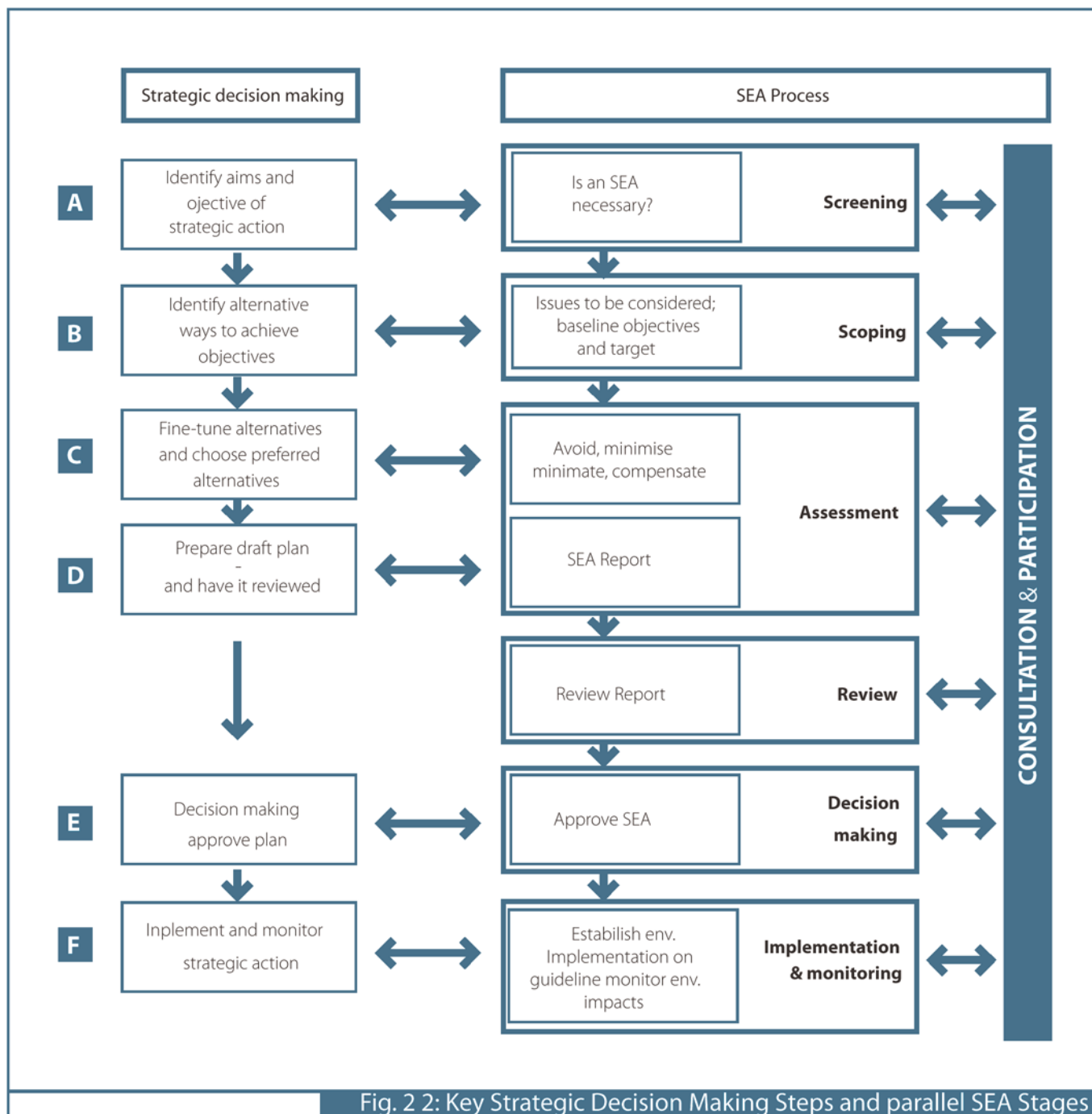
## 2.2. SETTING OUT THE SEA: PRINCIPLES, PROCESS AND STRUCTURE

### 2.2.1 Principles, Process and Structure

As outlined in Section 1, the SEA Directive states that the SEA process must be directly linked to the preparation of a transport infrastructure plan and programme, assessing not only the proposed plan, but also feasible alternatives which may be environmentally preferable.

These objectives are consistent with and dependent on the adoption of an approach to SEA which is participatory and integrative. They can be achieved by following accepted SEA principles:

- SEA should be applied, at the earliest stage, to all transport infrastructure plans that may have environmental consequences.
- Planners should preferably start a dialogue with environmental experts as soon as it is decided that a new transport infrastructure plan (or major change of an existing plan) is to be prepared. In particular, as shown in Figure 2-2, the dialogue should start once the objectives of the strategic action have been identified
- The plan initiator is responsible for the preparation

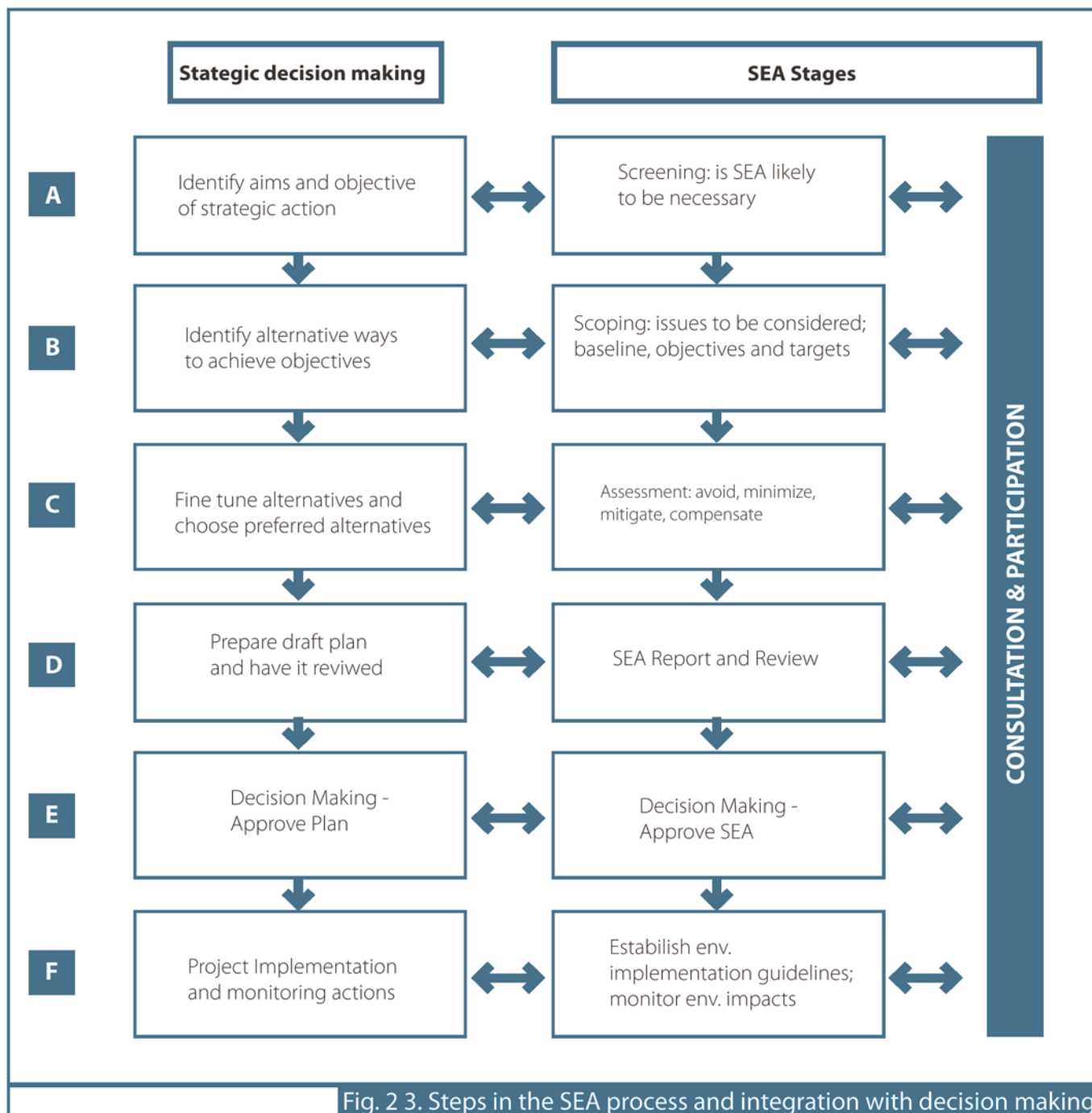


of an SEA report for the transport infrastructure plan and, according to the SEA directive statements, should collaborate with environmental authorities, who are aware of environmental objectives and sensitivities. The most appropriate timing for this is in parallel with the scoping activity.

- The SEA report must be reviewed by environmental and other interested parties and by the public. To this end, interested and affected groups should be aware of the steps involved in an SEA process and of the available opportunities for participation. The results of the SEA process should be understandable to these groups. The review should establish

that the SEA report actually describes the impacts of the proposed plan, as well as possible alternatives and the reasons for their rejection.

- The SEA report should be presented to the decision-makers at the same time as (or as part of) the proposed transport infrastructure draft plan. The competent authority should take the SEA report into account in decision-making. When the competent authority makes its decision about a proposed transport infrastructure plan, it should make explicit reference to the SEA report, justifying its decision if it is unable to adopt some of the SEA report recommendations.



- The structure of an SEA process (the precise steps taken) depends on the planning procedure to which the SEA is linked. The structure of the SEA process, as an instrument for informed decision-making, should therefore be flexible.

Figure 2-3 illustrates the key elements of an SEA process inspired by the participatory and integrative approach promoted in this Sourcebook. When a transport authority starts the preparation of a transport infrastructure plan, a decision must be made as to whether an SEA is necessary. This is the “screening decision”, the first step of the SEA process, which must be taken very early in the planning process. Article 3 of the SEA directive lists the

typology of plans and programmes for which the SEA is required. Annex 2 to the directive shows in turn the criteria to determine whether the plan or programme to be analysed is likely to have environmental effects. The further steps leading to the submission of an SEA report and a transport infrastructure proposal (and beyond) may depend on the national system of SEA and of infrastructure planning. However, the steps indicated in Figure 2-3 are applicable in most transport infrastructure planning contexts. The SEA process outlined in figure 2-3 thus illustrated calls for the following observations:

- **Environmental** objectives for the transport infrastructure plan should be specified within the SEA



Table 2 1- Positive and Negative Effects of SEA Integration into Decision Making Process

	SEA Fully Integrated	No SEA Integration
Positive Effects	<ul style="list-style-type: none"> <li>Saves time, money and prevents late surprises</li> <li>Puts SEA at the heart of decision making – it internalises environmental considerations, helps to define environmental ToR for each planning task, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Simple and straightforward procedure</li> <li>Enables detailed assessment of likely environmental effects</li> <li>Focus on elaboration of environmental report</li> </ul>
Negative Effects	<ul style="list-style-type: none"> <li>Possible internal disputes between members of the team in charge of SEA may be hidden – external stakeholders are only fed with pre-negotiated findings</li> </ul>	<ul style="list-style-type: none"> <li>Usually comes too late – new alternatives and proposals may be opposed by planners and decision makers</li> <li>Prolongs the entire planning process</li> <li>Late assessment</li> </ul>

Source: adapted from J.DUSIK (2004)

process, or if defined as part of the overall transport planning objectives, they should be assessed by the SEA. This normally forms part of the scoping phase.

- **Integration** of the SEA’s findings into planning, and **consultation and participation** of environmental authorities, other public and private organisations and groups and the public, should occur throughout the SEA process.
- The scoping phase and the environmental assessment phase both require **baseline information** about the initial state of the environment and its foreseeable development. This information may be gathered from existing sources. If necessary, additional baseline data may be gathered through dedicated studies and surveys, always bearing in mind that information should be consistent with the level of detail and the nature of the strategic action being assessed.
- It is finally worth noting that, even if Figure 2-3 presents a schematic, linear description of the steps in the SEA process, each of these steps may be more or less explicit, or occur in a different order. Steps may be repeated several times, and there may be iterations of earlier steps as further environmental, and non-environmental, information becomes available.

### 2.2.2 The Concept of SEA Integration into Planning and Decision Making Process

Having discussed the importance of process integration it must also be acknowledged that ensuring full integration of SEA into transport decision making processes requires a correct understanding of the nature of decision-making. Evidence from practice has shown that SEA implementation is frequently structured as something external to such processes, as a legal requirement having its own separate logic, which often hinders its adequate and effective consideration at the time of taking key decisions. Successful integration of SEA is therefore related with the way it serves the underlying transport decision making processes by providing adequate inputs at appropriate stages of the process.

The table 2.1 synthesises the main aspects that decision makers should be aware of when appraising both positive and negative effects of integrating (or not) SEA into decision making processes.

Strengthening SEA as a tool to aid decision takers also requires a correct understanding of its specific contribution. In fact, decisions are taken after considering a number of different (and at times conflicting) views and variables, where the environmental perspective is only one of those. This Sourcebook, in line also with more general developments in SEA practice and theory, recommends that the environmental aspects be understood as part of a whole, and as a specific contribution that should be properly assessed within an interdisciplinary perspective.

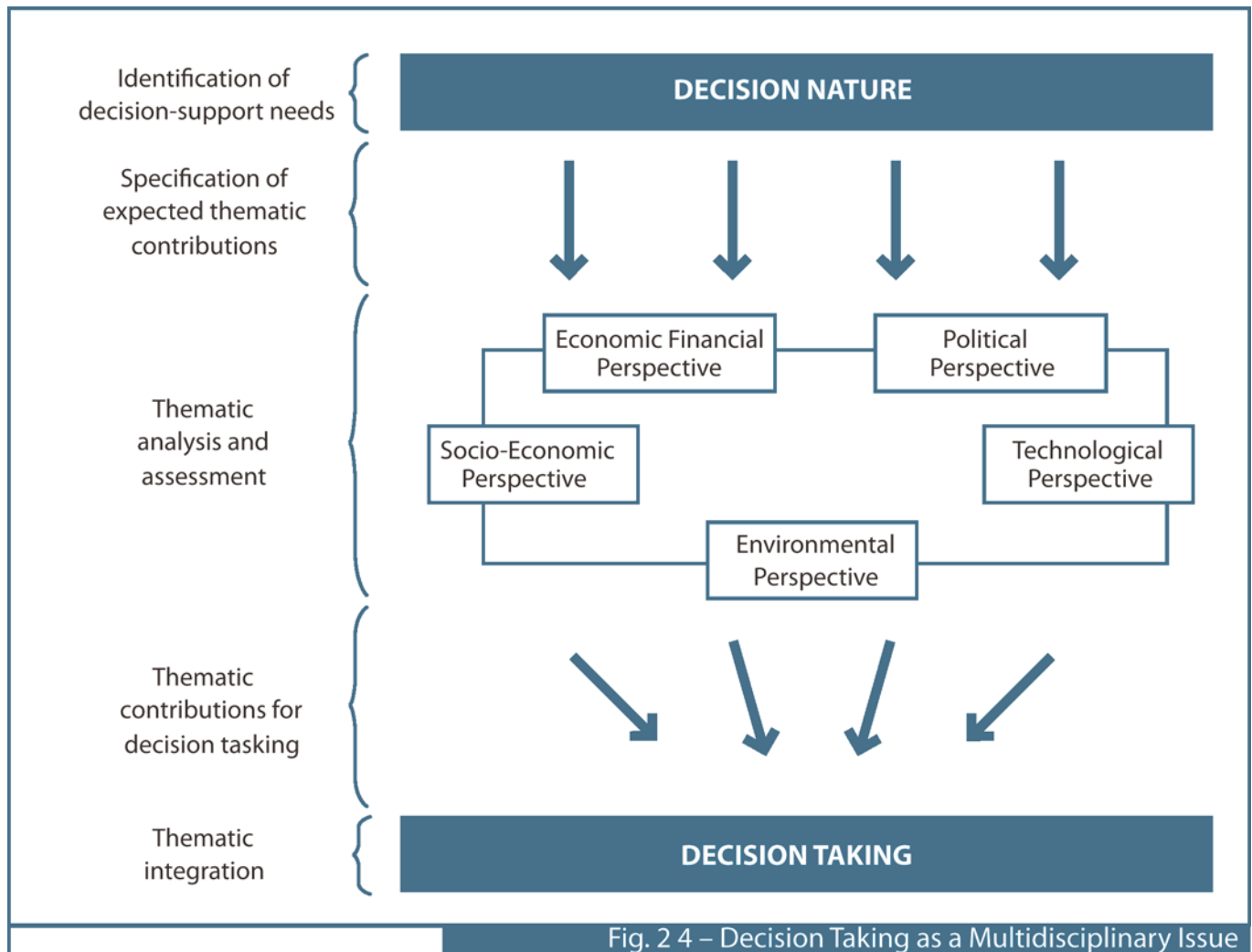


Fig. 2 4 – Decision Taking as a Multidisciplinary Issue

Thus, it is important that the SEA process is developed in a participatory and integrative way, ensuring that different perspectives, opinions and values contribute to the understanding of the transport issues, and – crucially – to the search and evaluation of alternative solutions.

In order to improve the effectiveness of SEA, it is useful to understand the process of planning and decision-making which shapes the policy, plan or programme under assessment<sup>4</sup>. In general terms, typical decision making processes behind the formulation of transport plans and programmes can be broken down in the following three main stages: **(i)** decision on plan/ programme elaboration, **(ii)** decision on the alternative to be selected and **(iii)** decision on plan/ programme approval. These stages include iterations and can present different configurations, depending always of national specificities and practices, however in general most decision-making processes will include them.

### Elaboration

The **first stage** occurs when political bodies are aware of certain challenges and/or needs in the transport system requiring a global intervention through a plan or a programme. A political decision is taken in order to start producing such a plan/ programme and the corresponding guidelines are then issued. An assessment framework is simultaneously defined in order to improve planning/ programming outputs in very diverse but complementary domains (e.g. environmental, socio-economic, financial and technological). In addition to these technical components of the decision making process, a consultation framework to include public and stakeholders' perspectives is also likely to be drawn at this stage. Planning/ programming, assessment and consultation findings on a number of different alternatives constitute the main outputs of this stage but, as well, crucial inputs for the following stage.

<sup>4</sup> see for example: Caratti et al. 2004

### **Alternatives setting**

The second stage is again triggered by the need for a political decision, which in this case is related with choosing the most adequate alternative to be technically developed. Planning/ programming procedures will now be focused on the preparation of a draft proposal on the selected alternative which will build upon technical and participatory inputs derived from the previous stage, as well as upon updated political guidelines. This draft proposal will feed an in-depth assessment and will be submitted to public and stakeholders' consultation in order to improve it. As the final proposal includes assessment and consultation results, it constitutes the main input for the following stage.

### **Approval**

Finally, the third and last stage will consist in the approval (or refusal) of the plan/ programme final proposal by the competent political bodies. At this stage the decision making process (regarding plan/ programme elaboration) formally reaches its end, while implementation is just waiting for its beginning. Accordingly, a special effort must be made in order to ensure continuity and feedback in the implementation phase.

One may thus conclude that it is paramount to ensure that SEA processes are designed and tailored to the characteristics and strengths and weaknesses of the existing decision making process (and not the opposite, as it often happens). Failure to do so will result not only in reduced SEA effectiveness, but also in delays of decision making process itself.

### **2.2.3 Pro-active identification and evaluation of options and alternatives**

Perhaps the most critical stage of planning and strategic assessment is the definition and assessment of alternatives (see also the Fact Sheet: 4.5 "Project alternatives and forecasting methods"), and the steps and intermediate decisions that lead to these are all critical. SEA design ought to ensure that process integration is particularly effective in relation to all these steps, in order to maximise the pro-active dimension of this decision-support mechanism.

Since the early 1990s, the constructive (pro-active) character of SEA has been considered a key feature of this new mechanism and one that should have distinguished it

from project-EIA. Such character is reflected in the requirements of the SEA Directive that it should go beyond the simple reactive mitigation of environmental impacts of actions that have already been decided upon. Instead, it should be used pro-actively to inform decisions by making suggestions on what alternatives to consider and identifying the most favourable alternative for minimising negative environmental impacts at the outset and if possible enhance positive effects. There are different types of alternatives at strategic levels, such as:

- "Do nothing" or "continue with present trends".
- Demand reduction, e.g. reducing the transport demand by acting (e.g. at urban level) on the traffic attraction points.
- Fiscal measures, e.g. toll roads or congestion charges.
- Modal split plans, e.g. increasing the accessibility to collective modes
- Construction of new infrastructures, considering different location approaches, e.g. increasing the capacity of existing roads versus the construction of new roads.

Pro-active assessment means that the process should be open to all reasonable options and alternatives. In a tiered planning and decision system, different combinations of alternatives are likely to be considered at different tiers. For example, when dealing with transport infrastructure network extensions, it is important that "obviating development" options were previously considered, i.e. options that would make new road connections unnecessary. Generally speaking, pro-active assessment means considering all feasible options for meeting overall objectives, i.e. managing rather than simply meeting anticipated demand. The range of alternatives should therefore also include those that may lead to a reduction of demand. A recent SEA Directive related example is provided by the draft guidance on the effective implementation of the SEA Directive in England<sup>5</sup> which addresses 'obviation of development' in forceful terms, as follows:

*"It is no longer enough just to consider different possible locations for development. The shift from predict and provide to plan, monitor, manage means that alternative ways to meet needs or respond to development demands should also be considered, including different types of development, and ways of obviating development, e.g. better local amenities or services might make some*

<sup>5</sup> ODPM, 2002

*journeys unnecessary. Obviation is not the same thing as restricting or thwarting demands. It should be seen as looking for different, more sustainable means to, achieve human quality of life ends. For example, obviating journeys should be seen as providing people with access to the things they want with less need for mobility.”*

In transport SEA, those alternatives that consider options for managing demand, i.e. for potentially obviating ('unnecessary') development should be addressed first (such as e.g. redirecting traffic towards less sensitive infrastructure). Once there is a clear idea on need and demand, alternatives and options can be developed and evaluated for meeting them. If a need for extending the existing infrastructure network is established, the question of location and timing will need to be addressed. Figure 2-5 shows this hierarchy of alternatives, as suggested by the UK ODPM draft guidance on the effective implementation of the SEA Directive. This figure also illustrates how SEA can apply, with different characteristics and methods, to all strategic activities. Developing and comparing alternatives allows the decision-maker to determine what the most favourable options are. However, it is acknowledged that in reality this may not always be a straightforward task. At times, options and alternatives may not be strict "either-or" choices (e.g. road vs. rail transport), but rather of a "mix-and-match" nature, such as multimodal combinations for freight transport.

### 2.2.4 Raising Strategic Questions

There is a final aspect of planning which needs to be addressed. This refers to the fact that in practice it is rare to find a hierarchy of strategic transport initiatives (policies, plans, programmes and corridors) leading in a linear manner to projects. More often than not actors are confronted with a more irrational planning context. For example, the five SEA pilot studies commissioned by the EC in 1998 showed that corridors are often not consistent with the type (level) of planning that takes place within MSs:

*‘In general... the experience [of the pilot studies focusing at] at corridor level has shown that most countries’ planning framework do not include the concept of transport corridors as formalised planning units with explicit decision-making processes. This effectively means that - in general there are no “transport corridor” plans or programmes (or indeed policies), and as such, no decision into which “SEA of a corridor” can feed [and hence influence]’<sup>6</sup>*

Furthermore, a persistent focus on 'corridors', 'infrastructure' and 'projects' is likely to conflict with the overall effort of promoting a more comprehensive, integrated approach to transport - essential in the pursuit of sustainable solutions, as widely illustrated in EU transport policy initiatives. In line with these concerns,

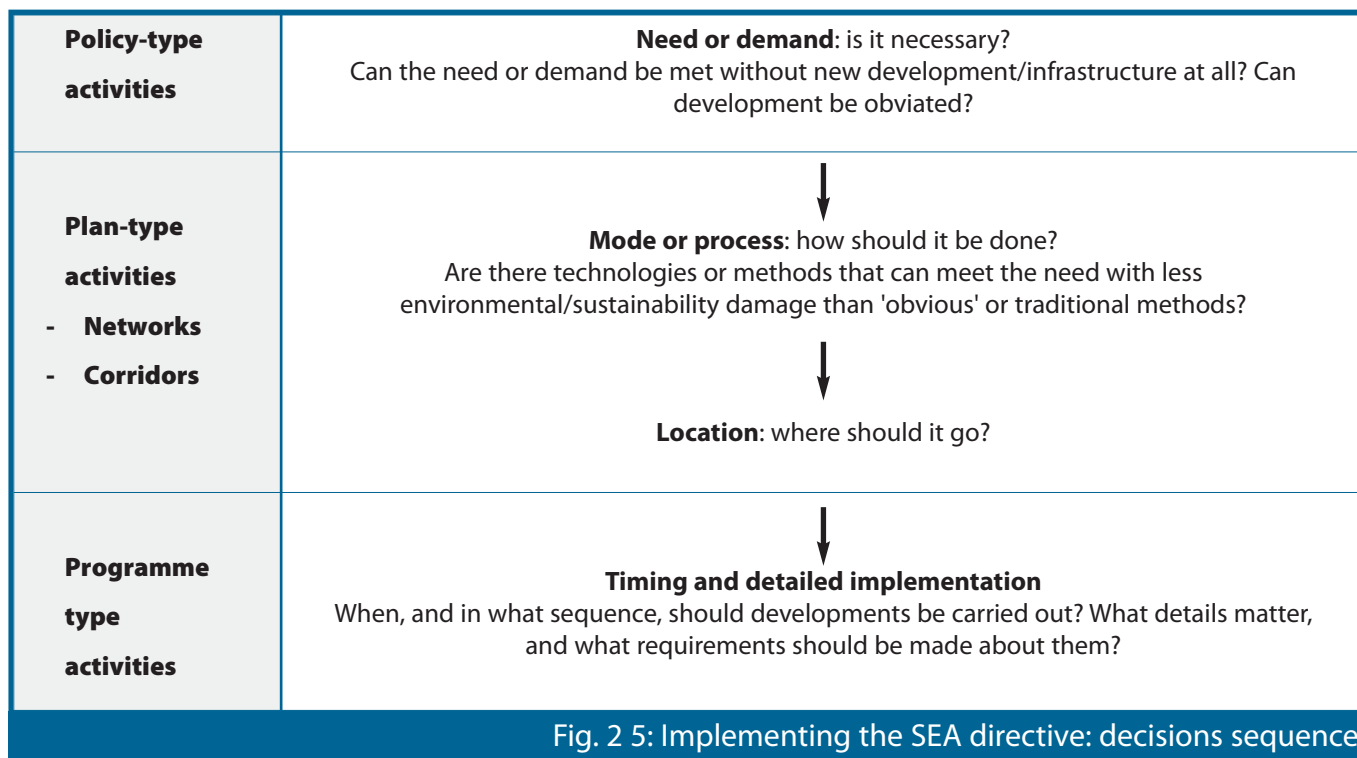


Fig. 2 5: Implementing the SEA directive: decisions sequence

Source: adapted from ODPM, 2003

<sup>6</sup> Bina 2001:32

users and experts have stressed the need to look at the broader picture, even when the initiative under assessment is – strictly speaking – more a project than a strategic action (a condition that can apply to many TEN-T corridors).

In order to promote the pro-active spirit of SEA, and to maximise its contribution to environmental protection and sustainable development (as per Article 1 of the SEA Directive), it is recommended that - for example in the case of corridors – non-infrastructure alternatives such as demand management and the use of fiscal measures are also considered, even if they go beyond the constraints of the corridor concept. This wider approach to the definition of transport problems and their possible solutions corresponds to the lessons learnt in the field of SEA over the last decade, whereby the added value of SEA (compared to EIA) lies first and foremost in its ability to raise strategic questions<sup>7</sup>. Thus, this Sourcebook invites practitioners to ask questions about:

- the reasons for the strategic initiative (the framing of the problem);
- the nature of the issues and their link to other policies and plans within the same sector and from other related sectors (e.g. regional development and nature conservation in the case of transport);
- the range of objectives that should be considered in order to address the problem(s);
- the range of alternatives that should be considered in order to address the problem(s), which in the case of transport should not be limited to a choice of location/routing since this could also be the subject of an EIA that includes cumulative assessment techniques.

Recognizing and understanding the imperfections of transport planning and decision-making is a critical step that enables the definition of adequate and effective processes and tools for SEA (see Section 3). Strategic thinking and sustainable development go hand in hand, as illustrated most recently by the OECD and UNDP review of sustainable development strategies around the world. In cases where there is insufficient strategic thinking behind certain initiatives (be they called policies, plans, corridors or programmes) SEA can act as a 'compensating mechanism'<sup>8</sup> in those institutional and administrative contexts where there is a weak capacity to promote sustainable planning. Indeed, practice can provide a range of examples of this wider concept of SEA. The gradual application of SEA in MSs (and other countries around the world) is leading to better plans and programmes, but

perhaps more importantly, it is also leading to the identification of structural problems and obstacles to the pursuit of environmental protection and sustainable development at planning and policy-making level.

Thus, this Manual invites users at MS and regional level authorities to develop SEA approaches and methods that promote strategic and sustainable thinking in the transport sector. Table 2.2 in the following page provides a framework for raising some of the strategic questions mentioned above. In particular this table prompts planners and assessors to think more broadly about the strategic initiative, thus helping them to raise important questions at the earliest stages of decision-making.

It is finally worth adding that it may be necessary for the planner to redefine the initial objectives in the light of the emerging findings of the assessment (see also page 2-19: Structuring and managing the process).

## 2.3. MANAGING THE SEA PROCESS

### 2.3.1 Introduction: framework conditions for effective SEA

In order to conduct SEA effectively, the appropriate framework conditions need to be established. In this context, formal requirements are important for ensuring that SEA is applied in a consistent manner, providing as much certainty as possible to the actors involved in SEA and PPP processes. Furthermore, explicit provisions to consider assessment results in decision making (article 8 of the SEA Directive) and a clear allocation of competences and responsibilities is important, also to demonstrate commitment to SEA.

Guidance for action in SEA (annex 1 of the SEA Directive) is all the more effective when it is expressed through clear goals that reflect a shared set of beliefs, e.g. concerning sustainable development strategies, state of the environment reports, or the environmental objectives established in existing environmental legislation. Objectives and systems which are accepted by all actors have shown to be particularly useful. In their absence, SEA might rather indicate differences in opinions than lead to clear solutions.

Insufficient political will and a limited societal support base are barriers for the effective application of SEA and will take time to overcome. Furthermore, compartmentalized organizational structures and bureaucratic prerogatives may be in the way of effective

<sup>7</sup> Bina 2003

<sup>8</sup> Bina (2003:203)

SEA application. Therefore, careful consideration of decision making traditions is of great importance for effective SEA application. In order to develop effective SEA, changes to existing PPP systems need to be considered, as is implied by the SEA Directive, advocating a structured and systematic SEA process.

A clear focus and boundaries setting are important for effective SEA. Ultimately, this should help to create situations in which PPP actors do not only struggle over defining the issue, but are actually also dealing with the question “*what can be done to address it?*”. In this context, the definition of clear tasks that are relevant to actual public decisions is of great importance.

If applied within a tiered system (article 4 of the SEA Directive), SEA can help to shorten and simplify PPP - and ultimately Project - making, saving time and money. In this context, the role of the assessor may be more clearly defined and differentiated according to context. Taking Figure 2-5 (see page 2-13) as an example:

- policy situations would be marked by a low degree of knowledge and concreteness. Here, assessors may find themselves as policy **mediators**, supporting a wide debate on overall objectives and values.
- in plan situations, assessors may find themselves acting as entrepreneurs, advocating values and goals formulated in higher tier policies.
- as programme situations would be marked by a high degree of knowledge and concreteness, assessors may act as technicians, using previously defined stakeholder values in multi-criteria analysis and cost-benefit analysis.

In order to achieve a willingness to co-operate in integrating environmental aspects into strategic decision making, administrations, agencies, politicians and other decision makers need to consider themselves as *real* actors in the PPP process. This is supported by article 8 of the SEA Directive, requiring SEA results to be considered in decision making. In this context, both parts of learning need to be fully addressed in the assessment process; cognitive learning, where knowledge is the dominant variable, and social learning, where communication between different actors and their values may lead to the reformulation of policy issues.

It is important that actors involved in the SEA process

are made aware of and acknowledge that uncertainties and unforeseeable impacts are likely to occur in all strategic situations (implied in annex 1 of the SEA Directive). If uncertainties are not explicitly acknowledged, actors might be disappointed with the outcomes of SEA and as a consequence, the influence of subsequent SEAs may be greatly reduced.

Finally, appropriate funding, time and support are of essential importance for being able to conduct SEA in a meaningful manner. Sufficient time needs to be made available in the interest of reliable results and effective consultation and participation. Box 2-3 summarises context elements enabling and supporting effective SEA application.

### **Structuring and Managing the Process**

Each of the steps of the SEA process should be divided into phases with clear tasks, roles and responsibilities. At the end of each phase, intermediate decisions should be made to validate the outcome and to assess, or re-assess, what remains to be done.

Transparency is greatly enhanced by agreeing upon a clear procedure at the outset of the SEA process. Such a procedure may specify (i) the initial problem description for strategy development, (ii) the objectives of the SEA process, (iii) the sequential steps of the procedure (i.e. documents and decision points), (iv) the time frame, (v) provisions for consultation and participation, (vi) the actors and their roles.

By way of example, a possible procedure is presented in Table 2-3 below. Such a procedure, which is established at the strategic level, may be further integrated into a general assessment and decision-making procedural framework<sup>9</sup>.

The SEA process should respond appropriately to the various inputs from consultation and participation. Also, the interaction between the transport planning team and the environment team may yield unexpected outcomes. The SEA procedure should therefore be flexible with respect to its phasing and organisation. Flexibility can be ensured in a number of ways:

- anticipating possible outcomes from consultation and public participation;
- communicating frequently, and at an early stage, with interested agencies and groups;

<sup>9</sup> It is important to underline that the Directive does not explicitly require a separated scoping report: such an information is in law part of the Environmental Report and must be treated as such (e.g. in public consultation etc); see also Section 3, Chapter 3.6 and Fact Sheet 4.2: "Communication and Reporting"

Table 2 2: Standardized tiered transport planning and SEA framework

Type of activity/tier	Focus	Tasks	Process	Assessment issues/ Core indicators
Policy related	All options* that might lead to meeting overall policy objectives and targets	<ul style="list-style-type: none"> <li>analysis of current situation listing existing economic, social and environmental objectives and targets and adaptation to transport</li> <li>identifying different development scenarios (e.g. economic and spatial)</li> <li>identifying different policy options* that may lead to objectives and targets</li> <li>evaluating options in the light of scenarios, indicating trade-offs for achieving objectives and targets, policy - assessment</li> <li>monitoring actual developments</li> <li>adjusting policies regularly</li> </ul>	Integrated process (some flexibility likely to be necessary)	<ul style="list-style-type: none"> <li>Energy consumption</li> <li>CO</li> <li>CH<sub>4</sub></li> <li>NO</li> <li>NO<sub>x</sub></li> <li>SO<sub>2</sub></li> <li>Land take</li> <li>Biodiversity</li> <li>Safety</li> </ul>
Plan related (network level)	National or regional infrastructure development options leading to specific projects	<ul style="list-style-type: none"> <li>analysis of current situation identifying - inter-modal – development options according to needs identified in policies</li> <li>assessing impacts on different options in terms of objectives and targets, network assessment; indication of possible tradeoffs (combining with economic assessment)</li> <li>feedback to policies</li> <li>monitoring actual developments</li> <li>adjusting network plans regularly</li> </ul>	Full SEA process, integrated or parallel with regular feedbacks	<ul style="list-style-type: none"> <li>CO<sub>2</sub></li> <li>SO</li> <li>NO<sub>x</sub></li> <li>NMVO</li> <li>CO</li> <li>Severance</li> <li>Land take &amp; impacts on soils, water, air, flora and fauna, biodiversity</li> </ul>

\* Options may include petrol price increases, vehicle taxes according to CO2 emissions, subsidies for motor vehicles, parking policies, road pricing, speed limits, access restrictions, new infrastructure, better public transport, transport management systems, public campaigns and others

Table 2 2: Standardized tiered transport planning and SEA framework (continued)

Type of activity/tier	Focus	Tasks	Process	Assessment issues/ Core indicators
Plan related (corridor level)	All options* that might lead to meeting overall policy objectives and targets	<ul style="list-style-type: none"> <li>analysis of current situation</li> <li>potential impacts of preferred options, possibly uni-modal (only if multi-modal alternatives are addressed at both, policy and network level) corridor-assessment</li> <li>monitoring actual developments</li> <li>feedback to policies and networks</li> </ul>	Full SEA process, integrated or parallel with regular feedbacks	<ul style="list-style-type: none"> <li>severance</li> <li>noise</li> <li>biodiversity</li> <li>visual impacts</li> <li>land take and harmful emissions on air, water, soils, flora, fauna</li> </ul>
Programme related	National or regional infrastructure development options leading to specific projects	<ul style="list-style-type: none"> <li>analysis of current situation</li> <li>identifying priority projects using multi-criteria-analysis or cost-benefit analysis, programme-assessment</li> <li>monitoring actual developments</li> <li>regular adjustment of programmes</li> <li>feedback to previous tiers</li> </ul>	Full SEA process, integrated or parallel with regular feedbacks	<ul style="list-style-type: none"> <li>potential environmental damage translated into costs or factors</li> </ul>
Project related	Project design	<ul style="list-style-type: none"> <li>analysis of current situation</li> <li>optimise project design in terms of policy objectives and targets (project-assessment)</li> <li>monitoring actual developments</li> <li>feedback to previous tiers</li> </ul>	EIA process	<ul style="list-style-type: none"> <li>severance</li> <li>biodiversity</li> <li>visual impacts</li> <li>noise</li> <li>land take and harmful emissions on air, water, soils, flora, fauna</li> </ul>

- listening to signals and clearly explaining the SEA process;
- making short-term or framework contracts with consultants to swiftly respond to uncertain/unexpected outcomes.



## Box 2 3 Context elements enabling and supporting effective SEA application

- *Providing formal requirements, clear provisions and competences to conduct and effectively consider SEA*
- *Establishing clear, transparent and consistent value frames and expectations*
- *Considering and influencing traditional decision making approaches*
- *Establishing a clear focus – addressing the right issues at the right time*
- *Clearly defining roles of assessors and planners*
- *Achieving a willingness to co-operate in integration*
- *Acknowledging and dealing with uncertainties*
- *Providing appropriate funding, time and support*

### 2.3.2 Applying management tools

The initiator may appoint an SEA process manager, who is in charge during the whole SEA process. The following management tools are particularly helpful in the assessment step:

- setting **clear targets** for the SEA report and its intermediate drafts;
- establishing an **inter-disciplinary team** of experts (e.g. ecologists, traffic modellers, socio-economic experts, landscape planners, etc.);
- ensuring good **collaboration** between the planning and environmental authorities.
- enabling effective **feedback** to be made between assessment results and the planning process, for example by:
  - using management tools as PERT and GANTT diagrams;
  - circulating early versions of the draft plans and assessments among those taking part in the planning and assessment work;
  - stationing planners and environmental experts in the same location;
  - applying team-building techniques;
- ensuring that consultation and participation can be carried up and providing inputs as early as the planning phases;
- ensuring that the results of the evaluation are taken into consideration in the **final decision**.

Even in countries where co-ordination between different government ministries, institutions or administrative levels is not institutionalised, there are many advantages in setting up informal collaborations between these institutions in carrying out an SEA. This is particularly true in countries where environment ministries are not

influential. Managing public participation is described in Section 3, Chapter 3.6 and in the Fact Sheet 4.2: "Communication and Reporting".

The SEA Directive requires MS to prepare an Environmental report "in which the likely significant effects on the environment of implementing the Plan Programme and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated". The Directive moreover adds that the report shall take into account "...the contents and level of detail in the plan or programme, its stage in the decision-making process and the extent to which certain matters are more appropriately assessed at different levels [like the project EIA] in that process in order to avoid duplication of the assessment". The type of data and information this report should provide is outlined in the Annex 1 to the Directive. Table 2-4 shows the contents of the SEA procedure documents highlighted in table 2-3, linking the main type of data and info with the reporting structure suggested by the annex 1 of the directive. Box 2-4 provides an example of a possible structure for an Environmental Report taken from FGSV 2004 (the German Research Association for Roads and Traffic)

Table 2 3 Structuring the process

Step	Phase	Reporting	Actors	Consultations
<b>Scoping</b>	Initial phase of the SEA process: Reshape plan or programme (PP) objective to include environmental & sustainability issues	Inception note	Initiator	
	Identify targets & ; describe environmental baseline	Scoping document (first part of the SEA Report, see table 2-3)	Initiator and competent authority	Environmental authorities, NGOs
<b>Impact Assessment</b>	Initial planning and Impact assessment phase	Second part of the SEA report (draft); Transport Infrastructure plan	Initiator	
	Consultations	Report of comments	Initiator and competent authority	Environmental authorities, NGOs, public
	Final planning and Impact assessment phase	Final SEA report and Final Transport Infrastructure plan	Initiator	
<b>Review</b>	Quality check of the SEA report; Consistency with the scoping objectives an the external recommendations	Review report	External independent experts	
<b>Monitoring</b>	Description of the measures envisaged for monitoring	Monitoring Report (part of the SEA report, see table 2-3)	Initiator	

### 2.3.3 Barriers to Effective SEA Implementation

SEA implementation within the framework of transport plans and programmes faces a number of barriers which hinder its effectiveness and consideration by decision takers. Thus, it is important not only to identify such barriers, but also to devise ways and means to overcome them.

#### **Political barriers**

A first issue to be considered, when dealing with SEA integration into transport decision making processes, is the need to ensure clear political support from governments. Without the appropriate level of political support, SEA results are likely to be given insufficient consideration by decision takers when a transport plan or programme is at stake. While legal prerequisites on SEA are important, they are not sufficient to ensure that environmental issues are properly and truly considered in transport decision making processes, namely when it refers to strategic levels of decision.

Another important issue has to do with the involvement of stakeholders and the general public. Transport-related decisions are likely to affect - directly and/or indirectly - several sectors and populations, prompting the need to ensure that consultation and participation mechanisms are included in the process throughout the relevant phases. This is a major challenge, considering that previous exposure of the general public to the practice of consultation and participation is usually limited, particularly for what concerns the discussion of transport and environmental issues at a strategic level (as opposed to consultation on concrete, physical projects).

Finally, special attention must be given to transboundary issues, where the SEA Directive provides basic requirements but not detailed guidance. Nevertheless it is worth noting that, according to Decision 884/2004/EC amending Decision No 1692/96/EC on Community guidelines for the development of the trans-European transport network, the Commission will "develop suitable methods for implementing the strategic environmental assessment with the objective of ensuring, inter alia, appropriate coordination, avoiding duplication of effort, and achieving simplification and acceleration of planning processes for cross-border projects and corridors." See also the Fact Sheet 4.6 on the transboundary issue that provides suggestions on the actions to be undertaken by the MS to this regard.

#### **Technical barriers**

As literature and practice review has shown, SEA is far from having asserted itself as a stabilised and widely used tool to support decision making processes. Technical issues are still viewed as a major constraint, emphasising the need to provide general but effective guidance on how SEA can be applied to real-world situations, and provide added value with respect to other commonly used approaches (namely EIA). To pursue the effective application of the SEA Directive, further efforts are required to build a common framework among Member States, notwithstanding the need to take due account of national specificities.

As a consequence, capacity building must be forcefully encouraged within institutions bearing strong responsibilities in planning and environmental issues, notably through targeted campaigns for the recruitment and training of SEA technicians.

Finally, practice has led to the identification of specific data needs when performing environmental assessments at both strategic and project levels. Those needs are particularly important when a transboundary assessment is at stake, requiring extra efforts in the co-ordination between Member States and the EC to ensure the production and use of consistent and compatible data.

### 2.3.4 Further reading

- Bina, O. (2001) *Strategic Environmental Assessment of Transport Corridors: Lessons learned comparing the methods of five Member States*, final report by Environmental Resources Management for DG Environment, January 2001. European Commission, Brussels (also available at <http://europa.eu.int/comm/environment/eia/sea-support.htm>).
- Caratti, P., Dalkmann, H. and Jiliberto, R. (Eds.) (2004) *Analytical Strategic Environmental Assessment: Towards Better Decision-Making*, due in 2004, Edward Elgar Publishing Ltd, Cheltenham.
- OECD and UNDP (2002) *Sustainable Development Strategies - A resource book*, Earthscan Publications Ltd, London.

Table 2 4 Reporting details

<p><b>Inception note</b></p>	<p>Description of the type of decision which the initiator intends to make (What is it about? What problems should it solve?). The inception note is intended to inform the discussion during consultation and participation. The initiator may express his/her preliminary views about the issues to be covered in the SEA</p>
<p><b>Scoping document</b></p>	<p><u>Overall</u>: Decision about the scope of the assessment: the environmental objectives the transport infrastructure plan should try to address.  <u>In particular</u>: (from annex 1 to the SEA Directive, points a-e):</p> <ul style="list-style-type: none"> <li>(a) an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;</li> <li>(b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;</li> <li>(c) the environmental characteristics of areas likely to be significantly affected;</li> <li>(d) any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;</li> <li>(e1) the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme</li> </ul>
<p><b>SEA (and Monitoring) Report</b></p>	<p><u>Overall</u>: Statement about the environmental effects of the proposed transport infrastructure plan that is submitted for decision-making  <u>In particular</u> (from annex 1 to the SEA Directive, points g-h):</p> <ul style="list-style-type: none"> <li>(e2) the way the environmental protection objectives outlined in (e1) and any environmental considerations have been taken into account;</li> <li>(g) the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;</li> <li>(h) an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;</li> <li>(i) a description of the measures envisaged concerning monitoring in accordance with Article 10 (of the Directive)</li> </ul>
<p><b>Review report</b></p>	<p>Evaluation of the SEA report (consistency with the scoping objectives and the issues raised during the consultation phases)</p>

**1. Description of the traffic plan/programme (a)**

- 1.1. Objectives of the plan/programme
- 1.2. Interrelationships with other traffic plans/programmes
- 1.3. Implementation procedure
- 1.4. Traffic forecasts and reasons for scenario adoption

**2. Scoping**

- 2.1. Avoiding duplication of assessment
- 2.2. Methods used
- 2.3. Planning area
- 2.4. Timeframe adopted for assessment
- 2.5. Data sources
- 2.6. Forecast horizon
- 2.7. Scenarios

**3. Sustainable development and environmental protection objectives (e)**

- 3.1. Established objectives
- 3.2. Other objectives
- 3.3. Reasons for excluding other objectives
- 3.4. Indicators
- 3.5. Environmental quality standards

**4. State of the environment without implementation of the plan/programme (b, c, d)**

- 4.1. Environmental assessment of the current planning area
- 4.2. Likely evolution of the environment within the forecast horizon based on the chosen scenario
- 4.3. Relevant environmental problems, in particular those relating to any areas of a particular environmental importance
- 4.4. Assessment of environment using objectives above (see 3.1-3.5)

**5. Environmental effects of the current traffic network (d)**

- 5.1 Current network and likely evolution within the forecasting horizon (status-quo-network)
- 5.2 Environmental effects of the status-quo-network, current and for the forecast horizon
- 5.3 Assessment using objectives above
- 5.4 Recommendations to reduce the environmental effects of the status-quo-network

**6. Environmental effects of the projects (f, g, h)**

- 6.1. Description of the projects including their interrelationships
- 6.2. Justification of the projects from the traffic viewpoint
- 6.3. Statement on how the recommendations (see 5.4) have been taken into account
- 6.4. Description of and reasons for selecting the alternatives (system-, site- and design-alternatives)
- 6.5. Measures to avoid, reduce and offset adverse effects
- 6.6. Negative environmental effects (environmental impact) including secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary effects
- 6.7. Positive environmental effects (environmental relief, see 6.6)
- 6.8. Assessment of the projects and their alternatives using objectives above (see 3.)
- 6.9. Recommendations for integrating the projects into the plan/programme from environment's view

**7. Environmental effects of the new traffic network including the projects (f, g)**

- 7.1. Description of the new network
- 7.2. Statement on how the recommendations (see 6.9) have been taken into account
- 7.3. Negative environmental effects (environmental impact)
- 7.4. Positive environmental effects (environmental relief)
- 7.5. Assessment of the new network using objectives above (see 3.)
- 7.6. Recommendations for the new network from environment's view

**8. Recommendations for decision making process**

- 8.1. Legal requirements and discretionary scope
- 8.2. Conflicts between environmental and other interests
- 8.3. Recommendations for decision making process
- 8.4. Recommendations for traffic policy

**9. Monitoring (i)**

- 9.1. Overview (objectives, indicators, local and temporal requirements, responsibilities, data sources, remedial actions in case of unforeseen adverse effects)
- 9.2. Measures to monitor the network and the conditions of the chosen scenario
- 9.3. Measures to monitor the projects in the following planning stages
- 9.4. Measures to monitor the projects after realisation

**10. Difficulties in particular technical shortcomings or lack of know-how (h)**

**11. Non-technical summary (j)**

## **SECTION 3:**

### **CONDUCTING THE SEA PROCESS**

**Main focus:**

**Screening**

**Scoping**

**Environmental assessment**

**Review**

**Implementation and monitoring**

### 3.1. SCREENING

#### 3.1.1 Which infrastructure plans require an SEA?

##### **Plans requiring mandatory SEA in accordance with the SEA Directive**

Article 3 of the SEA Directive states that the plans and programmes requiring an SEA are those:

- “which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use and which set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC (the project EIA directive), or
- which, in view of the likely effect on sites, have been determined to require an assess-

ment pursuant to Article 6 or 7 of Directive 92/43/EEC (habitats directive).”

Moreover the MS shall determine which plans and programmes, other than those outlined above, which set the framework for future development consent of projects are likely to have significant environmental effects. MS can determine which plans and programmes have to be submitted to a SEA either “*through case-by-case examination or by specifying types of plans and programmes or by combining both approaches* (see the following paragraph)”. For this purpose, Annex 2 to the directive sets out a list of relevant criteria that shall be taken into account by the MS to ensure that “*plans and programmes with likely significant effects on the environment are covered by this Directive*”.

It is worth noting here that “the prediction of likely environmental effects is complex, especially in the context of relatively broad-brush or high level plans or programmes, where it may be

**Box 3 1: Annex 2 of the SEA Directive - Criteria for determining the likely significance of effects referred to in Article 3(5)**

1. The characteristics of plans and programmes, having regard, in particular, to	2. Characteristics of the effects and of the area likely to be affected, having regard, in particular, to
<ul style="list-style-type: none"> <li>• the degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources,</li> <li>• the degree to which the plan or programme influences other plans and programmes including those in a hierarchy,</li> <li>• the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development,</li> <li>• environmental problems relevant to the plan or programme,</li> <li>• the relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste-management or water protection).</li> </ul>	<ul style="list-style-type: none"> <li>• the probability, duration, frequency and reversibility of the effects,</li> <li>• the cumulative nature of the effects,</li> <li>• the transboundary nature of the effects,</li> <li>• the risks to human health or the environment (e.g. due to accidents),</li> <li>• the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected),</li> <li>• the value and vulnerability of the area likely to be affected due to:               <ul style="list-style-type: none"> <li>• special natural characteristics or cultural heritage,</li> <li>• exceeded environmental quality standards or limit values,</li> <li>• intensive land-use,</li> </ul> </li> <li>• the effects on areas or landscapes which have a recognised national, Community or international protection status.</li> </ul>



difficult to anticipate the outcomes of implementation at the time a plan or programme is adopted. The use of the word 'likely' suggests that the environmental effects to be considered are those which can be expected with a reasonable degree of probability" [SEA Guidance, DG Env.].

Box 3-1 summarises the contents of annex II to the Directive while box 3-2 provides a useful overview of the screening process, i.e. whether the plan or programme definitely requires an SEA, definitely does not, or whether it may do so depending on further assessment. It is finally worth adding that MS should ensure that their conclusions pursuant the provision of this article of the directive, also in the case they decide not to carry out a SEA, are made available to the public (Art. 7 of the directive).

### 3.1.2 How to screen?

#### **Early notification, agreeing procedures and screening criteria**

Usually the transport authority initiates the development of a transport infrastructure plan, and the competent or environmental authority screens the initiative. Since SEA should start at the earliest stage of the planning process, the competent and environment authorities should be notified as **early as possible**<sup>10</sup>.

The screening process mainly amounts to verifying the legal basis for SEA and applying the specific provisions laid out in the Directive (see also Box 3-1 below). A dedicated committee may be set up to this end to enforce the systematic review and application of the screening criteria, as described e.g. in Box 3-2.

### 3.1.3 The time dimension

#### **Lengthy timescale of transport infrastructure planning and irreversibility of many infrastructure decisions**

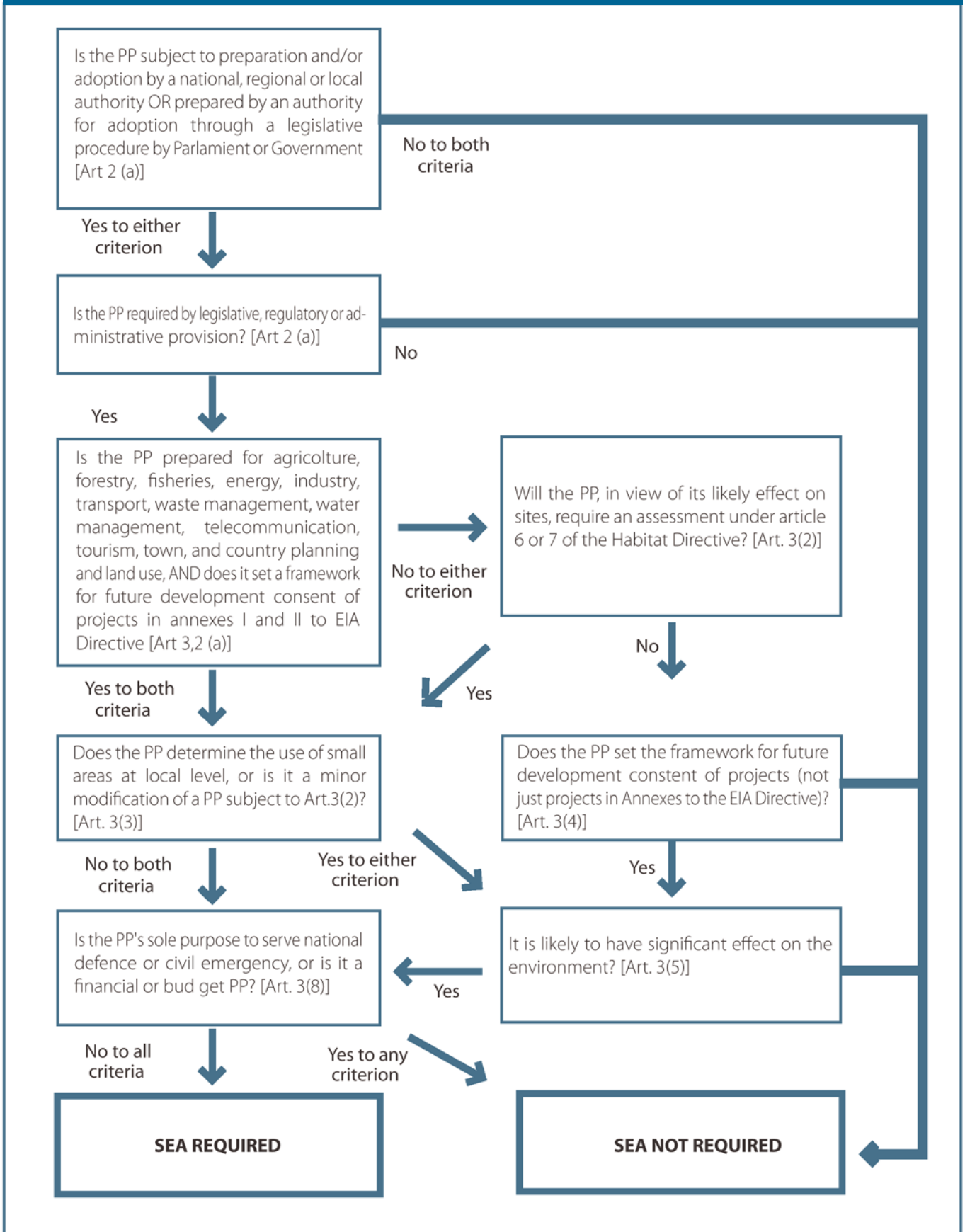
Making a series of tiered decisions, from highly strategic to project level, based on thorough assessments, can take many years. Planning

periods of more than 20 years have been observed (although in many countries decision-making and assessment procedures have recently been revised, in order to prevent delays and increase quality). This means that current projects are influenced by strategic decisions taken years ago, when SEA was not practised. This implies an inevitable period of transition which ideally should be dealt with by subjecting existing transport infrastructure plans to ex-post SEAs to inform current projects that depend from their strategic view. However, this may not always be possible since reconsidering strategic alternatives through SEA takes time and many transport problems are so urgent that there may not be time to wait for the outcome of such an ex-post SEA before making decisions at lower levels. Moreover, strategic decisions made in the past, whether binding or not, are difficult to reverse, even if their impacts were shown to be significant. It is recommended that each lead transport authority (at national and/or regional level) carries out a qualitative cumulative impact assessment of transport and related projects within the same region or river basin, to identify likely significant impacts and take appropriate action to provide – as far as possible – strategic alternatives, mitigation plans and compensatory mechanisms for the projects in the area.

### 3.1.4 Further reading

- European Commission, 1996d. *Guidance on Screening*. Directorate-General XI, Brussels. (This publication considers the screening phase in the environmental impact assessment of projects. It identifies, among other things, project, location and impact factors determining the need for EIA. Suitably adapted, it can be used at the SEA level.)
- British Office of the Deputy Prime Minister and the Scottish Executive, the Welsh Assembly Government and the N. Ireland Department of the Environment, July 2004: Draft Practical Guide to the SEA Directive 2001/42/EC

<sup>10</sup> In some circumstances, the transport authority may be the competent authority



Source: Sefton MBC Methodology for SEA screening;

[www.sefton.gov.uk/PDF/Sefton%20methodol%20for%20SEA%20screening%20interim%20final%20201004.pdf](http://www.sefton.gov.uk/PDF/Sefton%20methodol%20for%20SEA%20screening%20interim%20final%20201004.pdf)

*For the German Unity programme criteria for the consideration of environmental effects had been developed co-operatively by the Ministry of Transport and the Ministry of Environment and an agreement has been signed. The environmental considerations have been detailed within supplementary guidance. Both Ministries agreed on additional environmental requirements for a specific project to be inserted in the later licensing procedures*

*Source: Bundesministerium für Verkehr, 1992*

## 3.2. SCOPING

### 3.2.1 What is scoping and how to do it

The most common definition of scoping in SEA refers to a range of tasks that will specify the activities and objectives of the SEA-process. As a minimum, also with regards to the SEA Directive, this stage should define the broad contents of the SEA Report and the likely significant environmental effects to be considered. In practical terms, scoping must (i) provide direct input for the selection of strategic alternatives, and (ii) establish the concrete framework for the subsequent environmental assessment.

Scoping represents the turning point of any SEA: it defines its chances of success in informing and contributing to a positive outcome for the transport initiative and for environment and sustainability - as clearly illustrated in the five pilot corridor SEAs<sup>11</sup>, but also in much of the practice reviewed<sup>12</sup>. One of the weaknesses of scoping in the past has been the failure to understand and develop its strategic dimension. By widening and adapting the critical step of scoping, this Sourcebook intends to address the challenges identified from practice and proposes tasks which are consistent with the participatory and integrative approach to SEA advocated by the Sourcebook in Section 2.

The following are recommended as critical elements of a good scoping phase. They are divided into two main categories: process and substantive<sup>13</sup>:

#### **Process elements of scoping:**

- Who is involved and how:
  - Identification of the authorities, institutions and individuals to be involved
  - Distinction in terms of responsibilities and roles: some actors will be involved in providing information, views, others will be asked to comment on initial propositions, others may be asked to collaborate with the transport authority on particular tasks (for example the definition of objectives for the strategic initiative). Three different activities can be envisaged:
    - Consultation within and between public authorities;
    - Cooperation within and between public and private authorities on different aspects of the planning and assessment processes;
    - Participation of civil society and stakeholders during critical stages of the planning and assessment processes (in particular on aspects of scoping and to discuss the preliminary results of SEA);
  - Structuring the participatory process:
    - Use of standing committees;
    - Use of regular internal meetings and briefings;
    - Use of workshops, expert panels, conferences;
- Timing:

<sup>11</sup> Bina 2001

<sup>12</sup> Dalal-Clayton and Sadler 2004; ECMT 2004

<sup>13</sup> Bina 2002

- Propose a timetable for when should each scoping task take place;
- Clarify (and maximise) the links and synergies between each scoping task and any related activity part of mainstream transport planning. This is particularly important in this Sourcebook, given its emphasis on process integration;
- Resources:
  - Identify resources needed (funding, expertise, data, tools, etc);
  - Identify synergies and overlaps with other processes, including other assessments, which may lead to a maximisation of efforts and inputs (for example, common use of data gathering efforts);
  - Highlight problems and gaps.

#### **Substantive elements of scoping:**

- With regards to the strategic initiative under assessment:
  - Describe the type of initiative: a policy, plan or programme (see Fact Sheet 4.3 on “Concept of tiering in transport SEA”) and the reasons for the strategic initiative (the framing of the problem it is meant to address and solve). Defining the nature and scope of the problems is a critical decision which influences both planning and assessment, and should therefore be discussed from an environmental as well as transport perspective;
  - Define the link between the problems and issues to be addressed by the transport initiative, and other policies and plans within the same sector and from other related sectors (e.g. regional development and nature conservation in the case of transport);
  - Define clearly the stage of the planning process at which you are at: is it starting? Is there already a clear idea of the problem and objectives? Is there a draft? Depending on the answer, the whole SEA process and its role in relation to the planning and decision-making process will have to be adapted;

- Set the context, establishing the reference values for the assessment:
  - the range of objectives that should be considered in order to address the problem(s): environmental (and wider sustainable transport) objectives – ideally these should be discussed widely and openly with key actors and institutions identified above;
  - based on the objectives: define evaluation criteria or indicators, and where possible refer to existing targets and standards;
- Set the baseline data, collating and forecasting environmental data that is necessary and sufficient to support the assessment of such strategic initiative (this is an iterative process that continues through the SEA process);
- Identify the significant environmental effects to be considered (deciding the scope);
- Appraise strategic alternatives, identifying the type and range of options that should be considered in order to address the problem(s), and subsequently assessed using the reference values mentioned above. In the case of transport alternatives should not be limited to a choice of location/routing since this could also be the subject of an EIA that includes cumulative assessment techniques.
- Describe elements of the assessment process (significance criteria, consultations with experts, aggregation criteria, presentation of results);
- Justify leaving any issues out of the SEA that were proposed during the scoping process (for example, certain indirect effects).

Given its importance and central role throughout the whole SEA process, it is recommended that the scoping decision be laid down in a dedicated scoping document (see Box 3-4, 3-5 for brief summaries). This would help all parties directly and indirectly involved, as they could refer to a common document when discussing progress on the SEA process, promoting efficiency and transparency.

### 3.2.2 Why scoping?

#### General advantages of scoping

The general benefits of an early scoping phase are:

- It helps ensure that the environmental information used for decision-making provides a comprehensive picture of all the effects of the project, including issues that are of particular concern to affected groups and other interested parties. This should in particular also include possible environmental impacts of projects in other countries.
- It helps consider strategic alternatives, previously not examined, so that to some extent in the scoping phase one is invited to reflect again on the rationale of the entire project and think about alternative solutions. This is especially important in those – not uncommon – situations where a set of presumptions have already been made on the basis of past debates and political priorities.
- It helps to organise and focus the data and knowledge required for the SEA. It ensures that attention is focused on the issues that are of most importance for decision-making, avoiding the collection and presentation of unnecessary information and the ineffective use of scarce resources.
- It can help in effective management and resourcing of the SEA by encouraging early planning of the activities required to produce the environmental information. Of course it is obvious that the determination of what to do and not to do in the SEA-process (a result of the scoping phase) is also a necessary condition for planning and sche-

#### Box 3 4. Scoping decisions in the SEA of the HSR Zuid, The Netherlands

*The HSR Zuid is a major new high speed railway from Amsterdam to Antwerp. Decisions on the Dutch territory were, inter alia, made at the tiers of the Spatial Planning Key Decision (PKB) and the Route Decision (TB). The EIA legislation required that an SEA were undertaken for the PKB decision. The EIA procedure was formally linked to the PKB-procedure. Anticipating that (voluntary) EIA at the subsequent Route Decision tier would be undertaken, the PKB decision did not specify a precise alignment, leaving some uncertainty about the environmental impacts. In The Netherlands the EIA Decree prescribes that a scoping decision must be made by the competent authority. Both tiers were included in the same scoping decision, but the issues that could be postponed to the second tier were determined later. The scoping decision for the SEA at the PKB level dated from 1987. It did not refer to the Route Decision tier. The scope included the following main items:*

- *whether further rail capacity between The Netherlands and Belgium was necessary;*
- *what mode was most appropriate (e.g. conventional rail, high speed rail, or a completely different mode);*
- *where the HSR would be aligned;*
- *large-scale environmental impacts caused by effects on the existing rail network, the modal split and car and air transport effects on socio-economic spatial relationships;*
- *local impacts of alternative alignments for the HSR connection.*

*The PKB and the SEA dealt with the whether question. It compared two scenarios (part, or not part, of the European HSR Network), and it analysed transport alternatives varying from 'do nothing' via 'high speed trains on conventional railways' to 'the construction of an HSR (via different alignments) in the Netherlands'. The environmental impacts were assessed for each of the various alignments. This included the horizontal alignment (with a corridor width) and, where necessary to assess the impact of the whole route, the vertical alignment. To assess many of the large-scale impacts, the SEA made use of the information provided some time earlier in the international SEA for the Paris, Cologne, Brussels, Amsterdam and London network (1989). This included a generic comparison of the impacts of the HSR with the conventional modes of long distance transport, i.e. road traffic, conventional rail and aviation. The international SEA made overall estimates, amongst which were emissions of carbon dioxide, energy consumption, noise nuisance and traffic safety.*

*When assessing the environmental impacts of the European HSR Network, only traffic which was in competition with the network was considered. Therefore the study was restricted to long distance transport of passengers. Local travel or freight transport were ruled out of the scope of the SEA. For this reason some limitations were introduced. The modes of passenger transport considered were road, air and rail. The network, and the length to be studied, was selected and restricted. For rail transport 9,800 km of new lines, 14,400 km of upgraded old lines, and 25,000 km of the interregional existing rail network, including the existing 430 km French TGV line, were considered. For road transport, the network of roads parallel to the HSR lines was selected, with a total length of 31,450 km. For air transport 83 airports with regular intra-European commercial flights were taken into account in the calculations. Estimated impacts for each transport mode were limited to local impacts (land take and rural landscape), primary energy consumption, air pollution, noise pollution and safety.*

duling these activities. So, only after having completed the 'scoping' report the SEA-process can be planned

- It helps to improve the "smooth" embedding of the present SEA to other types of assessment at other levels. In the scoping phase one specifies the interfaces of the current SEA to assessments in other planning tiers and other assessment types (this could for example be EIA in a later stage of the present plan, but also SEA of other plans or programmes, as well as different "parallel" types of assessment like Cost-Benefit analysis).

### **Specific advantages: consultation, coordination, participation and learning**

In response to the lessons from practice, this Sourcebook places great emphasis on the participatory dimension of SEA, and distinguishes between consultation, cooperation and public participation. Accordingly, it recommends that the scoping stage is designed to promote the use of SEA as a process that will create or - where these already exist - strengthen mechanisms and opportunities for greater consultation and coordination (for example between transport, land-use and public works authorities). Scoping is also crucial with regard to the issue of transparency and participation, both of the public, stakeholders and in particular the private sector, which plays a key role in transport investments. It allows to plan the involvement of

outside bodies, it can provide a useful method of establishing contact with other agencies and authorities, interest groups, local communities and the general public. By involving these groups, scoping can increase the acceptability and credibility of the SEA and the decision-making process and reduce the risk of opposition emerging late in the day, causing delay and costs.

The comprehensive scoping phase recommended in this Sourcebook is also intended to promote the increasingly important idea of learning<sup>14</sup>, both in terms of learning between disciplines and sectors – such as environment and transport – and in terms of long-term social and organisational learning that can lead to cultural and structural changes facilitating sustainable transport policy-making. Thus, users are invited to design SEA processes that maximize the opportunities for learning through workshops, informal meetings to discuss lessons learnt, and similar.

The emphasis on discussion and transparency is also justified on the basis of an important characteristic of strategic level planning and assessment: uncertainty and value judgement. The importance of these aspects cannot be underestimated, as the formulation and assessment of strategic transport issues is leading to ever-increasingly complex links between technical, social, economic and environmental dimensions. Crucially, the European Commission itself, in its Communication on the use of expert knowledge in decision-making (EC 2002) draws the following conclusions for increasingly

<sup>14</sup> Bina 2003; Nilsson 2005

controversial issues:

*'scientific expertise is... as much about stating what is unknown, or uncertain with differing degrees of probability, as about setting out commonly agreed and accepted views....*

*Increasingly... the interplay between policy-makers, experts, interested parties and the public at large is a crucial part of policy-making, and attention has to be focused not just on policy outcome but also on the process followed'<sup>15</sup>*

This leaves no doubt that, at the heart of challenges to SEA, is the need to find ways of dealing with the uncertainty and value-laden choices intrinsic to strategic initiatives. Hence the emphasis in this section on building clarity and transparency in the scope of the SEA and on providing opportunities for dialogue and greater cooperation, as well as mutual learning through the moments of discussion.

### 3.2.3 Identifying and agreeing on objectives

#### **Description of the problem(s) and the objectives for the transport plan**

As mentioned above, the definition of objectives is a critical task of scoping, and one which carries great importance since the SEA process will use the set of environmental and sustainable transport objectives as a reference framework to assess the alternative solutions being proposed. Most SEAs are objectives-led, which means that the main purpose and outcome of an SEA is to establish whether the proposals:

- are making a contribution, or
- are leading to likely conflicts,

with the set of pre-defined and agreed objectives. This simple framework is particularly useful when taking strategic decisions, since it provides decision-makers with a clear reference to the essential point: their own objectives and whether the transport plan or programme is likely to contribute or conflict with them.

The task of defining and agreeing on objectives amounts to a detailed statement of the

initiator's objectives (what does the initiator want to achieve through the transport infrastructure plan?) and to determining the institutional and geographical context and the time frame of the plan.

This description will help to determine the environmental issues involved and the range of feasible options that can be taken into consideration.

The initial problem description represents the initiator's viewpoint. In some cases the problem description does not include environmental issues, although environmental impacts are clearly relevant. New objectives should be added after consultation, and specified in the scoping decision so that the plan can be assessed against these (it is difficult – for technical and political reasons - to include new objectives during the assessment step itself).

It is often useful if the initiator explains the background of the plan objectives at the outset of the scoping process. This may prevent requests to consider options that are not feasible. Preferably, the objectives should be justified on the basis of transport policy, environmental policy, standards, and spatial plans, as well as with reference to other major sector policies which have a direct or indirect link with transport (for example, regional development and cohesion policies).

A sound description of objectives is also important to reduce the risk that these (implicitly) reject feasible options that are environmentally preferable. For example, the initiator may formulate an objective as 'to construct a new road connection between A and B, minimising environmental impacts'; this objective implicitly rejects the option of widening existing roads or developing other means of solving the transport problem.

#### **Identifying environmental objectives and targets**

Objectives, indicators (especially for detailed programme-type initiatives) and (where available) targets, should be proposed and widely discussed as soon as possible. They should serve as a reference framework for the assessment stage:

- an objective is an expression of the desira-

<sup>15</sup> EC 2002:3

ble end-state or direction of development of an impact (for example, the greenhouse effect should be prevented);

- an indicator is a measurable (and foreseeable) quantity, used to directly or indirectly measure the achievement of objectives (for example, a direct indicator' is the emission of greenhouse gases, an indirect indicator could be 'vehicle kilometres');
- a target is the (often politically determined) value that an indicator should take (for example, a reduction of emissions of carbon dioxide by 20%).

If there is a lack of politically agreed environmental objectives and targets, these should be defined in the scoping phase, e.g. on the basis of consultation. If the relevant transport authorities do not already have an environmental and/or sustainability strategy for their sector, this task may prove difficult. Although many countries have defined some form of environmental policy, many others have not, or have only a very vague document which cannot provide the basis for this scoping task. It is therefore recommended that an environmental policy for the transport sector be adopted, providing objectives, indicators and targets. These can include, for example, targets for energy use, for the number of people suffering noise nuisance, or for compensation of the loss of ecosystems (e.g. 'no net effect' principle).

Some examples may better clarify these concepts<sup>16</sup>. Box 3-6 shows the 1995 Finnish transport and environmental policy targets; Box 3-7 describes the approach taken in the UK study on the Trans-Pennine Corridor; Box 3-8 shows the objectives specified for the German Federal Transport Infrastructure Plan (it should be noted that non-environmental targets are included, as the environment is only one of several planning criteria) and Box 3-9 shows the types of assessment objectives and indicators considered in the Austrian case study on the Danube Corridor. Finally Box 3-10 reports the case of a Swedish study on the Gothenburg-Jönköping Transport Corridor, in which the initial assessment objectives were not well defined, leading to the meaningfulness of some of the results of the SEA.

### 3.2.4 Identifying the indicators for appraising strategic alternatives

#### *Identifying indicators*

Once the geographical, temporal and assessment objectives and criteria and objectives have been defined, simple, measurable indicators should be chosen in order to allow comparisons between various alternatives. These indicators need to be directly relevant to the assessment objectives chosen and need to be supported by available data. Box 3-11 shows the French proposed criteria for the selection of indicators in the case of a Corridor SEA and boxes 3-12 and 3-13 show how, in two concrete cases, the assessment objectives have been linked to the related indicators:

#### *Appraising strategic alternatives*

The Directive requires the assessment of 'reasonable alternatives taking into account current knowledge and methods of assessment' (Article 5(1)). It should anyway be normal practice when developing a plan or programme to propose different ways of fulfilling its objectives. Each alternative can be tested against the SEA objectives. Positive as well as negative effects should be considered, and uncertainties about the nature and significance of effects should be noted. This will often be an iterative process, with the alternatives being revised to enhance positive effects and reduce negative ones.

It is, in any case, important to highlight that **it is not the purpose of SEA to decide which alternative should be chosen for the plan or programme**. This is the role of the decision makers who have to make choices on the plan or programme to be adopted. The SEA simply has to provide information on the relative environmental impact of alternatives.

In general the environmental impacts categories receive different priority levels in different situations and countries, and issues depend on feasible alternatives. The alternatives considered at project, corridor and network level vary from country to country, and between transport infrastructure plans. It is possible, however, to identify indicators that may be used to compare certain types of alternatives (to know

<sup>16</sup> Bina 2001 and oth.



more on the selection of alternatives see also the Fact Sheet 4.5 on “Project alternatives and forecasting methods”). The main distinction is between:

- alternative construction methods, design and detailed alignment (normally assessed at project level);
- alternative indicative routing, or siting in the case of nodal infrastructure (normally

assessed at corridor level);

- alternative modes and measures to influence traffic flows (assessed at corridor level or network level).

In all cases impacts are deemed relevant if:

- they can be influenced by the infrastructure plan. (The impacts selected during scoping must be sensitive to feasible variations in the proposed infrastructure plan/ programme. Appropriate indicators therefore

### Box 3 6 Selected targets for the environmental effects of transport in Finland

1. *Integration of environmental considerations into the preparation of transport system plans with the aim to reduce growth of transport, to maintain the market share of environmentally sustainable modes of transport and to decrease the adverse environmental impacts of transport.*
2. *Maintaining transport-related greenhouse gas emissions at the level of year 1990.*
3. *Reduction of NOx emissions and VOC emissions from road, air and rail transport by approximately 75 % by 2010 in comparison with the level of 1990.*
4. *Reduction of particulate pollutants from road transport and minimisation of adverse effects on health.*
5. *Prevention of new traffic noise pollution and reduction in exposure to traffic noise.*
6. *Reducing the number of people living in areas where daytime traffic noise level exceeds 55 dB at least 20 % by year 2020 compared to year 2003.*
7. *More efficient use of natural resources in land and water engineering and prevention of waste and surplus of soil generation.*
8. *Prevention of water and soil pollution by minimising entry of transport-related hazardous substances into the environment.*
9. *Investigation and processing of previously contaminated soil and sediments.*
10. *Protection of marine environment by minimising the risks of transport related hazardous substances, vessel traffic substances and spreading of alien species through vessel traffic ballast waters.*
11. *Preserving natural diversity in the planning and implementation of transport infrastructure projects.*

Source: Ministry of Transport and Communication, 2005

### Box 3 7: UK study on the Trans-Pennine Corridor: the assessment objectives

In the UK Trans-Pennine Corridor four primary objectives were agreed:

- to protect and enhance the environment;
- to promote safety;
- to promote adequate accessibility; and
- to promote economic efficiency of transport, and efficiency of economic activities.

Under each category, subsidiary objectives were defined. Those for environment are the following

Category	Objective
<p><b>Global Issues</b></p> <ul style="list-style-type: none"> <li>• Climate change</li> <li>• Regional air pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise emission of greenhouse gases</li> <li>• No excess of critical acidification loads and levels</li> </ul>
<p><b>Natural and Built Resources</b></p> <ul style="list-style-type: none"> <li>• Landscape, biodiversity, heritage and townscape</li> <li>• Water resources</li> </ul>	<ul style="list-style-type: none"> <li>• Enhance natural and built resources and townscape and minimise negative impacts on landscape, biodiversity, heritage and built environment</li> <li>• Minimise pollution of fresh and marine surface waters and groundwater</li> </ul>
<p><b>Community Issues</b></p> <ul style="list-style-type: none"> <li>• Noise</li> <li>• Air quality</li> </ul>	<ul style="list-style-type: none"> <li>• Avoidance of exposure to levels which endanger health or quality of life</li> <li>• Protection against recognised health risk for air pollution</li> </ul>

### Box 3 8. Objectives used for the German Federal Transport Infrastructure Plan and its ecological risk analysis

'Structural Goals'	'Performance Goals'
<p>Reduction of transportation costs Reduction of travel times Improvement of safety Improvement of spatial structure</p> <p>Improvement of environment Conservation of nature and Landscape</p> <p>Promotion of other benefits outside the traffic system of inland waterways for water supply</p>	<p>Reduction of vehicle standing and operating costs Reduction of travel times; shortening of routes Reduction of injuries and material losses by accidents Improvement of accessibility, improvement of job supply in weak areas Reduction of noise, air pollution and separation effects of traffic Less consumption of land; avoidance of water pollution as well as dangers to flora and fauna Improvement of the value of natural areas for recreation use</p>

### Box 3 9: The Austrian study on the Danube Corridor: topic areas for defining the objectives

The Austrian case study also bases its assessment objectives and indicators on existing objectives for environmental protection, derived from, for example, the Austrian National Environment Plan and the Toronto commitment to reduce green house gas emissions

Main Topics	Secondary Topics
<ul style="list-style-type: none"> <li>• Energy Consumption</li> <li>• CO2 emissions</li> <li>• All other emissions</li> <li>• Land use</li> <li>• Impacts on environment and regional development</li> </ul>	<ul style="list-style-type: none"> <li>• Economic Growth</li> <li>• Ensuring mobility</li> <li>• Ensuring access</li> </ul>

### Box 3 10 The Swedish study on the Gothenburg-Jönköping Transport Corridor

The Swedish study referred mainly to the goals of the Swedish EPA. These are essentially general environmental goals for transport, arranged in three categories:

- the use of land and water;
- stock resources; and
- pollutants.

However, failure to translate national level objectives in terms of the local characteristics and reality has led to problems. Almost all the Swedish transport initiatives resulted in conflict with these broadly defined objectives. The issues which were identified using the existing national policy and guidance documents were too generic and this, it was felt, had an impact on the meaningfulness of some of the results of the SEA. The experience showed the need for the definition of more operational transport and environment goals at national and regional levels.

depend on the assessment level. For example, energy use may not be an issue in a routing decision, whereas it may be in a modal decision.)

- they are not influenced by the infrastructure plan but legally required to be considered and mentioned in environmental legislation and policy (such as the Fifth Environmental Action Programme).

Table 3-1 shows indicators appropriate for comparing the above outlined types of alternatives. It is worth noting that this table is very comprehensive and elaborated and is applicable to detailed programme initiatives. For wider plans or programmes the list of impact to take into account may be drastically reduced (i.e.: Climate change, local air pollution, biodiversity and land-use, noise)

To know more on the indicators selection we

suggest to read the Fact Sheet 4.7 on “Criteria and Indicators” that shows in detail the type of indicators that may be used for the environmental assessment of detailed programs and mega projects.

### Box 3 11 Specification in the case of a Corridor SEA (the Corridor Nord Paris - Brussels)

Criteria	
The nature and level of the assessment	<ul style="list-style-type: none"> <li>this is an environmental assessment intended to feed into a multi-criteria analysis</li> <li>it refers to a large corridor, not a single route</li> </ul>
The scale of assessment	<ul style="list-style-type: none"> <li>scale varies between 1/100 000 and 1/250 000</li> </ul>
The method's replicability	<ul style="list-style-type: none"> <li>the indicators must be transferable to all corridor case studies; although adjustments will be necessary to reflect specific environmental characteristics.</li> </ul>
The durability of the indicators	<ul style="list-style-type: none"> <li>indicators must be valid throughout the life of the project and the infrastructure's development</li> </ul>
The multimodal character	<ul style="list-style-type: none"> <li>in order to favour the comparison and the calculation of cumulative impacts, indicators must apply to all terrestrial modes</li> </ul>
The transboundary character	<ul style="list-style-type: none"> <li>indicators will have to match each country's objectives and available set of data, and must remain homogeneous</li> </ul>
The baseline	<ul style="list-style-type: none"> <li>the indicators must identify change with respect to the state of the environment and the intrinsic value of the environment's natural and cultural resources before development takes place</li> </ul>
Homogeneity	<ul style="list-style-type: none"> <li>in order to facilitate decision-making, indicators should maintain a certain consistency in the way they are designed and in terms of their measurement units</li> </ul>
Simplicity	<ul style="list-style-type: none"> <li>only the most significant and relevant indicators should be developed. Their message must be easy to grasp and interpret. Their number must be limited in order to be able to visualise them and to integrate them into a multi-criteria</li> </ul>

Source: Bina 2001- INGEROP 1999

### Box 3 12: UK, SEA indicators and related objectives

Category	Objective	Indicator
<u>Global Issues</u> <ul style="list-style-type: none"> <li>Climate change</li> <li>Regional air pollution</li> </ul>	Minimise emissions of greenhouse gases No excess of critical acidification loads and levels	Change in quantity of CO <sub>2</sub> emitted  Change in quantity of NO <sub>x</sub> emitted (and related to areas exceeding critical loads and levels)

### Box 3 12: UK, SEA indicators and related objectives (continued)

Category	Objective	Indicator
<u>Natural and built resources</u> <ul style="list-style-type: none"> <li>Landscape, biodiversity, heritage and townscape</li> <li>Water resources</li> </ul>	Enhance natural and built resources and minimise negative impacts on landscape, biodiversity, heritage and built environment Minimise pollution of fresh and marine surface waters and groundwater	Land take and changes in traffic (pass.-km) in sensitive areas  Changes in traffic (pass-km) as a proxy of the potential for impacts from road run-off
<u>Community Issues</u> <ul style="list-style-type: none"> <li>Noise</li> <li>Air quality</li> </ul>	Avoidance of exposure to levels which endanger health or quality of life Protection against recognised health risk for air pollution	Change of population disturbed by noise  Changes in quantity of NO <sub>x</sub> and PM10 emissions

Source: Bina 2001 – MVA, ERM, David Simmonds Consultancy 1999

### Box 3 13: Austria (Danube corridor), Objectives/targets, criteria and indicators:

Environmental Targets	Assessment Criteria/indicators
reduce: <ul style="list-style-type: none"> <li>greenhouse gases</li> <li>air pollutants</li> <li>energy consumption</li> </ul>	reduce: <ul style="list-style-type: none"> <li>emissions of CO<sub>2</sub></li> <li>emissions of CO, NO<sub>x</sub>, CH, SO<sub>2</sub>, particles</li> <li>energy consumption (MJ) by fuels</li> </ul>
minimise land use	additional direct land use (ha)
minimise impact on areas	indirect land use (ha)
minimise impact on protected areas	length of infrastructure (+ impact of traffic) in nature reserves and landscape-protection areas
minimise impact on recreation areas	length of infrastructure (+ impact of traffic) in areas for landscape bound, quiet recreation
reduce of noise-impact	length of infrastructure (+ impact of traffic) in densely populated areas
no risks to important water resources	length of infrastructure (+ impact of traffic) in densely populated water resources
minimise impact on landscape	length of infrastructure (+ degree of completion) in sensitive landscape
minimise fragmentation of areas	density of the net, length of infrastructure in non-fragmented areas
no exceeding of impact limits	length of infrastructure (+impact of traffic) in preloaded areas

Source: Bina 2001 – Trafico 2000

### 3.2.5 Further reading

- European Commission, June 2001c. Guidance on EIA Scoping. Directorate-General XI, Brussels. (The aim of this publication is to provide guidance to developers and competent authorities on scoping at the EIA level. In some cases it can also be useful at the SEA level.)
- European Commission DG Environment-Olivia Bina – January 2001. Strategic Environmental Assessment of Transport Corridors: Lessons learned comparing the methods of five Member States
- European Environment Agency, 1999, .Environment in the European Union at the turn of the century. Environmental assessment report 2. EEA, Copenhagen. (This report is a report on the state of the European environment.)
- European Environment Agency, 1998a. Europe's Environment: The Second Assessment. EEA, Copenhagen. (This report gives an overview of the environmental situation in all countries of Europe, including an analysis of pressures and driving forces (which include transport))
- British Office of the Deputy Prime Minister and the Scottish Executive, the Welsh Assembly Government and the N. Ireland Department of the Environment, July 2004: Draft Practical Guide to the SEA Directive 2001/42/EC
- BEACON project, Rijswijk 2005. Deliverable D2.3 Indicators, tools, and data. (Report discussing, analysing and giving recommendations on the use of indicators in a SEA-context)
- Schmidt M. Joao E., Albrecht A (editors). Implementation of strategic environmental assessment. (Springer 2005)
- (Handbook on a wide range of SEA-related topics). A state of SEA-implementation in various members States). Information about the state of the environment and environmental policy can be obtained from the national environmental ministry in any member state.

## 3.3. ENVIRONMENTAL ASSESSMENT

*Read this chapter to find out about general methods for the analysis of environmental impacts of plan and programmes alternatives*

### 3.3.1 Definitions and requirements

As outlined in paragraph 2.4 of section 2, the SEA Directive obliges MS to prepare an Environmental report in which *"the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated"*. [art 5 (1)].

Whilst **identification** and **description** are covered within the scoping phase, the Environmental Assessment concentrates on **evaluation**, which is defined here as a process designed to contribute pertinent environmental information to the decision-making process of policies, plans and programs.

In practical terms, the Environmental Assessment phase must produce all environment related evidence required for decision making, and must do so by applying the specifications and recommendations issued in the Scoping phase.

The Directive states that [art. 5 (2)] the *"information that may reasonably be required"* to prepare the SEA report can be obtained making use of:

- current knowledge and methods of assessment
- and taking into account:
- the contents and level of detail in the plan or programme
  - its stage in the decision-making process

It is therefore important to note that the SEA Directive:

- explicitly requires an integration of the environmental assessment into the decision making process;

Table 3 1. Example of indicators for comparing alternatives

IMPACT	TYPES OF ALTERNATIVES FOR WHICH THE INDICATOR IS SENSITIVE		
	CONSTRUCTION METHODS, DESIGN, DETAILED ALIGNMENT	INDICATIVE ROUTING OR SITING	MODAL ALTERNATIVES
Resource depletion/waste	Resource intensity	<ul style="list-style-type: none"> <li>• resource intensity</li> <li>• energy use (if modes are compared)</li> </ul>	<ul style="list-style-type: none"> <li>• resource intensity</li> <li>• energy use</li> </ul>
Climate change	Not sensitive to project adjustments	<p>In cases where significant differences in route length arise)</p> <ul style="list-style-type: none"> <li>• emission of CO<sub>2</sub></li> <li>• vehicle kilometres</li> </ul>	<ul style="list-style-type: none"> <li>• emission of CO<sub>2</sub></li> <li>• vehicle kilometres by vehicle type</li> <li>• modal share in passenger kilometres and tonne kilometres</li> <li>• congestion</li> <li>• fuel consumption</li> </ul>
Acidification	Not sensitive for project adjustments	<p>In cases where significant differences in route length arise)</p> <ul style="list-style-type: none"> <li>• emission of NO<sub>x</sub> or SO<sub>2</sub></li> <li>• vehicle kilometres</li> </ul>	<ul style="list-style-type: none"> <li>• emission of SO<sub>2</sub> and NO<sub>x</sub></li> <li>• vehicle kilometres by vehicle type</li> <li>• modal share in passenger kilometres and tonne kilometres</li> <li>• congestion</li> </ul>
Local air pollution	Exposure of the population to above standard pollutant concentrations	Exposure of the population to above standard pollutant concentrations	<ul style="list-style-type: none"> <li>• emission of pollutants</li> <li>• likelihood that a large number of people will be affected</li> <li>• congestion</li> </ul>
Photochemical smog	Not sensitive for project adjustments	<p>In cases where significant differences in route length arise)</p> <ul style="list-style-type: none"> <li>• emission of NO<sub>x</sub> or SO<sub>2</sub></li> </ul>	<ul style="list-style-type: none"> <li>• modal share in passenger kilometres and tonne-kilometres</li> <li>• vehicle kilometres</li> <li>• emission of NO<sub>x</sub> and hydrocarbons</li> </ul>
Biodiversity	Land take and fragmentation of ecologically sensitive sites	Land take and fragmentation of ecologically sensitive sites	<ul style="list-style-type: none"> <li>• length of infrastructure</li> <li>• land take and land fragmentation of ecologically sensitive areas</li> <li>• distance from ecologically sensitive areas</li> <li>• risk of affecting key species populations</li> </ul>

Table 3 1. Example of indicators for comparing alternatives (continues)

IMPACT	TYPES OF ALTERNATIVES FOR WHICH THE INDICATOR IS SENSITIVE		
	CONSTRUCTION METHODS, DESIGN, DETAILED ALIGNMENT	INDICATIVE ROUTING OR SITING	MODAL ALTERNATIVES
Landscape	Land take, visual and other impacts on character of valued landscape areas	Land take, visual and other impacts on character of valued landscape areas	Land take, visual and other impacts on character of valued landscape areas
Noise/tranquillity	Exposure of the population to above standard noise level	Exposure of the population to above standard noise level-area affected by noise above a certain level	<ul style="list-style-type: none"> <li>• vehicle type and speed</li> <li>• vehicle kilometres</li> <li>• likelihood that a large number of people or tranquil areas will be affected</li> </ul>
Land take/proximity	Land take in, or in proximity to, different categories of land (including heritage areas)	<ul style="list-style-type: none"> <li>• land take in different categories of land</li> <li>• distance from sensitive areas</li> </ul>	Total land take per category
Impacts on water	Distance from sensitive sites	Distance from sensitive areas	Distance from sensitive sites
Accidents	Number of accidents or casualties Environmental damage caused by accidents	Number of accidents or casualties Environmental damage caused by accidents	Number of accidents or casualties Environmental damage caused by accidents

- be a specific methodology or level of detail for the information to be gathered, recommending, on the contrary, that this information ought to be obtained making use of “current knowledge and methods”;
- states that the impacts must be described in such a detail that correlates to the definition of the plan or programme. In practice, “in the environmental report for a broad-brush plan or programme, very detailed information and analysis may not be necessary, (for example, a plan or programme at the top of a hierarchy which descends from the general to the particular), whereas much more detail would be expected for a plan or programme that itself contained a higher level of detail” [Commented SEA directive, DG Environment]

Finally point (f) of Annex 1 to the Directive outlines that the likely significant effects the environmental impact assessment (see also box 3-14) have to deal with:

- biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors



### 3.3.2 Environmental Assessment within the SEA participatory and integrative approach

In chapter 2.1 of Section 2 it has been stressed that SEA provides a real value added to the making of policies, plans and programmes provided that, all along the SEA process, public participation and integration with strategic decision making are appropriately taken into account. Good practice is outlined in figures 2-2 and 2-3 of Section 2 and further represented in figure 3-1 below, showing how the Environmental Assessment phase is linked with:

- the parallel decision making (particularly for what concerns the identification and fine tuning of the PP alternatives);
- the participation activities
- and the previous and subsequent SEA process phases.

The Scoping and Environmental Assessment “boxes” and their linkages with the decision

taking stages illustrate the substantive stages of the SEA process, ultimately leading to the preparation of the SEA report for the final decision taking:

1. Setting the context (identifying objectives and evaluation criteria or indicators) and establishing the baseline (collecting baseline information and data)
2. Appraising strategic alternatives.
3. Assessing the effects of the plan or programme

#### **Setting the context and establishing the baseline**

This scoping phase has been described in the previous section. It must be complemented with the establishment of the Baseline, which provides the reference for predicting and monitoring environmental effects and helps to identify environmental problems and alternative ways of

#### Box 3 14: Criteria for determining significance

##### **Criteria for determining the likely significance of effects [Articles 3(5) and 5(1)]**

##### ***Characteristics of the effects and of the area likely to be affected, having regard, in particular, to:***

- *the probability, duration, frequency and reversibility of the effects;*
- *the cumulative nature of the effects;*
- *the transboundary nature of the effects;*
- *the risks to human health or the environment (e.g. due to accidents); and*
- *the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected)\*;*

##### ***The value and vulnerability of the area likely to be affected due to:***

- *special natural characteristics or cultural heritage;*
- *exceeded environmental quality standards or limit values;*
- *intensive land-use; and*
- *the effects on areas or landscapes which have a recognised national, Community or international protection status\*\**

*\* it is not mentioned in the directive, but the balance of exposure and benefit from the new infrastructure for each of the affected groups of users/residents is an important criterion*

*\*\* also not mentioned in the directive, may be persons with recognised need for protection should be taken into consideration*

dealing with them. The baseline preparation may in fact be considered as part of the Scoping phase, but is practically used in the assessment and monitoring activities. .

Sufficient information about the current and likely future state of the environment should be collected to assess the vulnerability of the area to environmental impacts and to allow the plan's or programme's effects to be adequately predicted. It should notably include data about land use, population, and ecosystems (to know more on the interaction between land use and transport, see also the Fact Sheet 4.4 on "Land use and transport integration"). Baseline data should, as far as possible, be adequately documented and of known quality, and updated at regular intervals in accordance with reliable procedures. . Data availability may impose constraints on the methods and scope of the SEA. However, developing new databases in the framework of a single SEA process may cause delay. Practical guidelines therefore include the following recommendations:

- make use of available data at a reasonable cost, acknowledging lack of data and using methods adapted accordingly (see paragraph 3.3.3);
- if this approach is expected to leave too much uncertainty in the impact assessment, gather additional baseline data as far as cost and time allow (and start as early as possible);
- where appropriate data are not available, or cannot be obtained in time, employ simpler methods to avoid delay;
- issue recommendations to statistical agencies regarding the optimisation of existing databases, or setting-up new regular monitoring systems, that will provide baseline data for future SEAs.

The following principles can help to manage the collection of information: [from the Draft Practical Guide to the SEA Directive, ODPM 2004]:

- The information collected should be relevant and appropriate to the spatial scale of the plan or programme.
- The focus for information collection should be on (i) characteristics of the PPP that are sufficient to identify their key environmental issues; and on (ii) aspects upon which the plan or programme may have a signifi-

cant effect.

- The data and information collected should be relevant to the SEA objectives and indicators

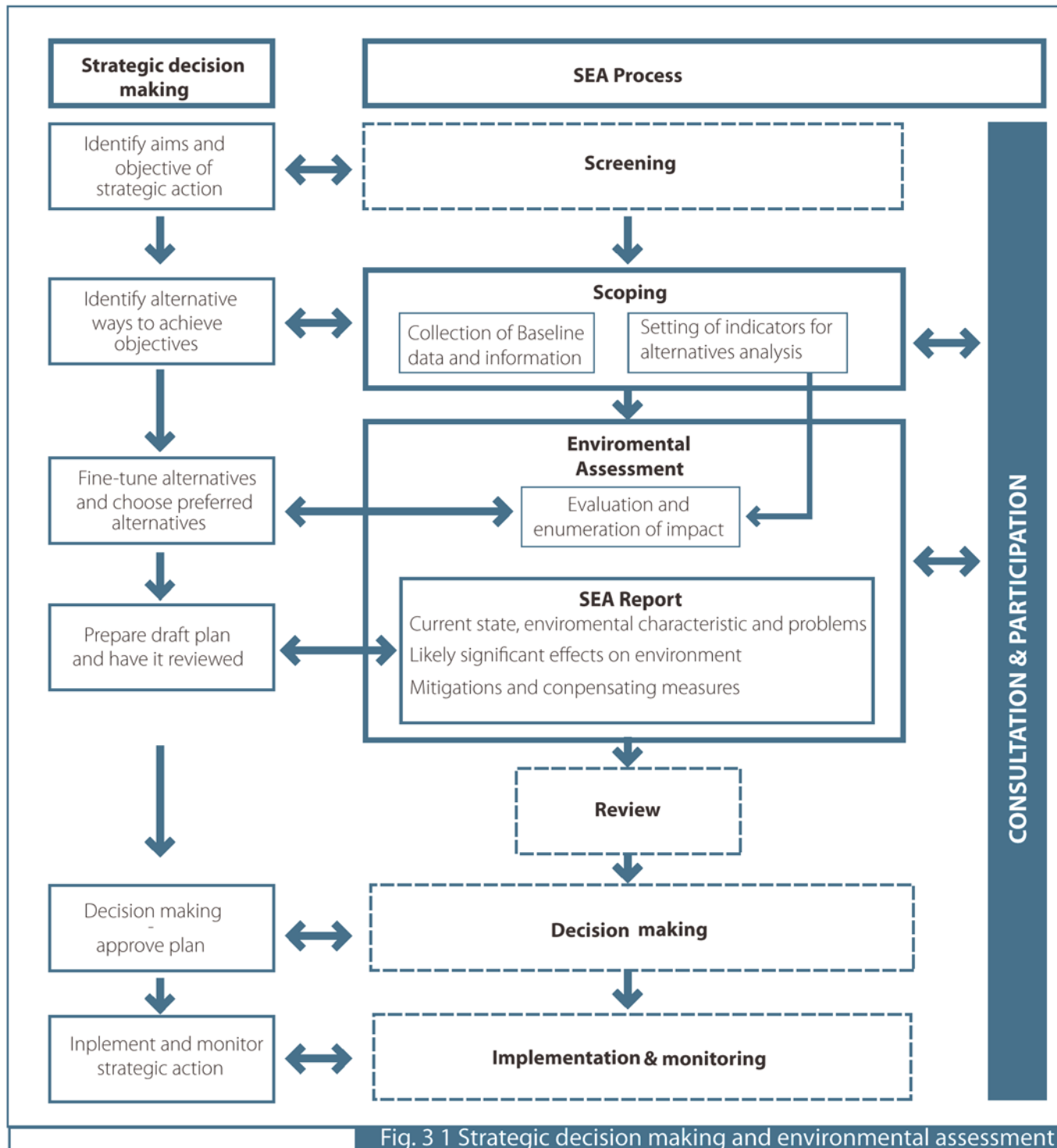
Baseline information may be both quantitative and/or qualitative. Quantitative information sets are usually built up from existing monitoring and research activities while qualitative information is likely to be based on judgement. For the purposes of SEA qualitative information needs to be supported by reasoned evidence. There are many sources and forms of information at both national and European level (see to this extent the section on the European data sources in the Fact Sheet 4.7 on "Criteria and indicators for sustainable transportations") but it is also important to explore different information paths like:

- Information included in other legislation, strategies, plans or programmes, which set the context for plan or programme preparation (see Box 3-15).
- Service providers (e.g. Consultation Bodies), who may be able to provide environmental data as well as technical advice and information.
- Other consultees, including both representative bodies and members of the public, who often have a wealth of knowledge and understanding of the strategy or plan area, e.g. NGOs, local conservation groups

Not all information may be available immediately. The SEA team should consider whether improvements are needed to current information collection to fill existing gaps. Ways of improving the availability of information can be included in proposals for monitoring the implementation of the plan or programme and, in turn, monitoring information collated during the implementation of various plans and programmes has the potential to be a valuable source of baseline information

Practice has demonstrated that even in the absence of extensive baseline data sets, useful SEAs (relying mainly on expert judgement) can be undertaken. Thus, even if the urgency of transport infrastructure plans does not allow time for extra data gathering, there is no reason why an SEA should not be undertaken.

A good example on the categories and type of data to be collected to take into account the



overall impacts of a transport infrastructure plan or programme, is provided by the DPSIR (Driving forces, Pressures, States, Impacts, Responses) Model of the EEA<sup>17</sup> Box 3-16 illustrates the application of this scheme to the transport sector,

where Responses have been substituted by examples of mitigation-compensation Measures.

<sup>17</sup> The causal framework for describing the interactions between society and the environment adopted by the European Environment Agency: driving forces, pressures, states, impacts, responses (extension of the PSR model developed by OECD). Definition source: <http://reports.eea.eu.int/SPE19961113/en/page005.html>

## Box 3 15 Relation with other relevant plans and programs and European Directives

Relevant plans, programs or objectives may include

- Land use or spatial plans for areas affected by the plan or programme, including those at different geographical levels (e.g. Regional Spatial Strategies, Local Development Frameworks and their component documents)
- European Directives, including the Habitats, Birds, , Air Quality, Water Framework Directives
- International undertakings such as those on greenhouse gases in the Kyoto Protocol
- National initiatives such as Biodiversity Action Plans
- White Papers setting out policies (e.g. Urban, Rural, Aviation)
- Environmental management and resource plans, e.g. River Basin Management
- Plans, Water Resources Strategies

Source: ODBM 2004

## Box 3 16: DPSIR approach to evaluate the environmental effects

	<b>D</b> <b>Driving forces are underlying factors influencing a variety of relevant variables</b>	<b>P</b> <b>Pressure indicators describe the variables which directly cause (or may cause) environmental problems</b>	<b>S</b> <b>State indicators show the current condition of the environment</b>	<b>I</b> <b>Impact indicators describe the ultimate effects of changes of state</b>	<b>M</b> <b>Measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment</b>	
<b>Biodiversity Population Fauna Flora</b>	Transport demand	Deterioration of the living environment (dissection or partial sealing of habitats, soil, water, air, noise etc.)	Number of (endangered) species, see also the convention on biological diversity <sup>18</sup>	Remaining habitat areas capable of carrying the population with the existing biodiversity	Modal shift, Emission thresholds, speed limits, access restrictions or pricing, rerouting <sup>19</sup>	Compensatory areas, bridges-tunnels for animals, collection of eluates, noise barriers, etc...
<b>Human health</b>	Transport demand	Number and type of vehicles passing by, emission, acoustic quality of the infrastructure	Persons affected by a certain immission level	Changes of the exposure		Noise barriers

<sup>18</sup> UNEP/CBD/COP/7/21/ Annex DECISIONS ADOPTED BY THE CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY AT ITS SEVENTH MEETING: [www.biodiv.org/doc/meetings/cop/cop-07/official/cop-07-21-part2-en.pdf](http://www.biodiv.org/doc/meetings/cop/cop-07/official/cop-07-21-part2-en.pdf)

<sup>19</sup> with the emission of climate gases normally rerouting is not effective, exceptions are differences in route length of the alternatives and different elevation profiles

Box 3 16: DPSIR approach to evaluate the environmental effects (continued)

	<b>D Driving forces are underlying factors influencing a variety of relevant variables</b>	<b>P Pressure indicators describe the variables which directly cause (or may cause) environmental problems</b>	<b>S State indicators show the current condition of the environment</b>	<b>I Impact indicators describe the ultimate effects of changes of state</b>	<b>M Measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment</b>
<b>Soil</b>	Transport demand	Usage for infrastructure, eluates	Soil usability, geological parameters, number of certain species per m <sup>3</sup>	Changes of soil usability, geological parameters, number of species	Collection and treatment of eluates, minimise soil usage
<b>Water</b>	Transport demand	Usage for infrastructure, eluates	Water quality TOC, COD, concentration of toxics...	Deteriorated water quality	Collection and treatment of eluates
<b>Air</b>	Transport demand	Emissions, infrastructure as wind shield	Immission, exceeding thresholds	Deteriorated air quality	(vegetation, allow air exchange)
<b>Climatic factors</b>	Transport demand	Climate gas emissions, local albedo and heat release	Concentration of green house gases GHG	Global warming, instable climate	Use of Alternative fuels, reduce energy demand
<b>Material assets</b>	Transport demand	Deconstruction, vibration, acid gases	Number and state	Deterioration of number and state of material assets	Decoupling of vibrations
<b>Cultural heritage including architectural and archaeological heritage</b>	Transport demand	Sealing, deconstruction, vibration, acid gases	Number and state, size of areas where archaeological heritage may be found	Reduction and/or damage of (potential) archaeological sites	Decoupling of vibrations
<b>Landscape</b>		Build Infrastructure	Visual quality	Deteriorated visual quality	Adequate architecture

### Box 3 17: policy and infrastructure options of the UK Trans-Pennine Corridor study

	<b>Strategy/Option</b>	<b>Description</b>
<b>1</b>	Do-minimum	Committed transport infrastructure schemes; current transport policies assumed to continue, but without any intensification; existing policies applied to land-use planning but with a high priority to economic development opportunities regardless of location
<b>2</b>	Public transport investment	Investment in improving primary rail service speed and frequency
<b>3</b>	Road traffic reduction - parking and trans-Pennine charging	Halving of parking capacity in urban centres, combined with parking on all major roads across the Pennines
<b>4</b>	Road traffic reduction - urban road user charging and trans-Pennine charging	Road user charging in urban areas, with higher charges for urban centres, combined with charging on all major roads across the Pennines.
<b>5</b>	Selective road capacity increases	Widening of the following motorways: M62 M6 to junction with A1 M6 M56 to M58 M1 M18 to M62 M60 Stockport to M62
<b>6</b>	Centralisation of land use development	Concentrate new development in major urban areas, particularly in or near their centres
<b>7</b>	Optimisation of trans Pennine charging	Adjustment of charges in Option 2 to maximise benefits in relation to total costs
<b>8</b>	Optimisation of urban road user charging	Adjustment of charges in Option 3 to maximise benefits in relation to total costs
<b>9</b>	Major road traffic reduction measures	Application of high fuel price increases (factor of 10) with trans-Pennine and urban road user charging as per Option 3
<b>10</b>	Public transport investment with road traffic reduction measures	Combination of an enhanced Option 1 with Option 7 and 8, plus testing of assumptions about the impact of potential changes in attitude to car alternatives. Land-use policy a more intense version of that for Option 6

Source: MVA, ERM, David Simmonds Consultancy - Bina 2001

Table 3 2 Assessment of alternatives against SEA objectives

SEA Objective	Option A		Option B	
	Performance	Commentary/ explanation	Performance	Commentary/ explanation
SEA Objective 1				
SEA Objective 2				
SEA Objective 3				
...				
SEA Objective n				
Additional comments				

Key for performance:  
+ positive - negative 0 neutral ? uncertain  
+ minor, ++ major  
A distinction could also be made between short, medium and long term, if appropriate

Table 3 3: Example of impact matrix (environmental objectives)

SEA Objectives	Strategic options or policies			
	A	B	C	D
Conserve and enhance biodiversity	-	-	0	++
Maintain and enhance the air quality	-	-	+	0
Minimise land use	++	+	-	-
Minimise impact on protected areas	++	-	-	+
Reduce of noise impact	+	+	?	0
...				
Proposed changes to the strategic options (mitigation measures)	+	-	++	?

### **Appraising strategic alternatives**

Here again, the relevant specifications have been provided in the scoping chapter, where a detailed list of indicators categories to evaluate the different plan and programme alternatives from the environmental point of view has been laid out. The attention should now focus on two important issues: (i) the integration of the different types of analysis generally carried out to appraise the alternatives (economic, technical and environmental) and (ii) the way to identify and compare alternatives. More information on the selection of alternatives (and on the transport demand forecast methods) is provided in the Fact Sheet 4.5 on "Project alternatives and forecasting methods"

The integration of different analyses needs to be managed carefully. For example, in terms of the identification, analysis and selection of alternatives, one should pay particular attention to the order in which they are subject to the different analyses. This has crucial implications for the overall outcome of the appraisal. For example, if in the first instance only economic and financial implications are considered, there is a risk to screen out options which are desirable from an environmental/sustainability point of view [Bina 2001]. As a matter of example box 3.17 shows the list of various policy options considered in the UK Trans-Pennine Corridor study.

In this case, consideration of the economic and financial feasibility together with infrastructure performance against overall objectives (steps 5 and 1) acted as the first "filter". In particular, Option 5 (Selective Road Capacity Increases), when tested using the transport model developed for the study, was found to perform poorly in relation to economic objectives since it had little effect on traffic flows and journey time. Given its poor performance in this respect and that it would certainly not give rise to any environmental benefits, it was scoped out and not taken forward for full assessment against the environmental objectives set for the study.

The lesson learned from this study is that the greatest benefits are to be obtained by the consideration of both infrastructure and policy-type alternatives: co-ordinating (and possibly integrating) the socio-economic, economic, transport and environmental assessments enables alternatives to be identified which are desirable from a number of perspectives, and are able to meet more than one type of objective (i.e. not

only a strictly environmental one).

As a general rule alternatives should be identified bearing in mind the overall objectives which have been set for the transport corridor - these will normally include a mixture of environmental, socio-economic and transport led objectives. Indirect, unwanted effects - such as e.g. possible "rebound" increases in traffic (and congestion) following the availability of new infrastructure - can thus be included in the analysis. Table 3.2 shows how alternatives can be assessed against SEA objectives.

The effects of a plan or programme can only be understood by comparing it with alternative options. Alternatives should be compared with each other and with "business as usual" ("do nothing", "minimum/zero options") option. A business-as-usual scenario plays an important role in decision-making since it provides the baseline against which to compare the effects of alternatives and will highlight the environmental/sustainability implications of a lack of action on strategic policy and infrastructure options. In the Danube corridor, for example, the Austrian consultants highlighted that a key benefit of this is raising awareness amongst transport planners and government decision makers on what the likely impact of doing nothing would be. This was particularly relevant because there is still some resistance to a move to more sustainable transport planning.

The alternatives can then be compared with the predicted implementation of the current or existing plan, to show what would happen without the new plan or programme. A comparison of this can then be made with current environmental conditions to show which alternatives would improve or worsen current conditions. There is no one "correct" comparison: different comparisons will reveal different points, and more than one can be significant. Alternatives put forward should be reasonable, realistic and relevant. Alternatives should also be sufficiently distinct in order to highlight the different environmental implications of each, so that meaningful comparisons can be made at a strategic level

An important alternative to consider is often the so called "obviation" option (see also Section 2, paragraph 2.2.3). In many cases obviation of demand is environmentally and socially better than providing for demand or rationing consumption through price or limited capacity. A



typical case of obviated alternative is for example to improve local amenities or services (homeworking, information technology) in order to reduce the travelling demand.

Finally it is important to stress that consultation and participation with stakeholders is again of great importance at this stage in planning and assessment. Open discussion about the alternatives which should be considered, as well as those which are likely to be scoped out following preliminary consideration, will help to identify realistic options, and reduce conflict at a later stage.

### **Assessing the effects of the plan or programme**

The assessment stage in SEA will vary significantly from case to case, depending on the nature of the strategic initiative under assessment. Responsible Authorities should seek to predict and evaluate the effects of elements of the evolving plan or programme, including alternatives, while they are working on them. Where adverse effects are seen to be likely, possibilities for mitigation should be considered. Aspects of this Stage of analysis may need to be carried out more than once in the course of a plan's or programme's development.

One of the most common, and influential, types of assessment is that which carries out a consistency analysis between the broad strategic policies or measures being proposed and the environmental (and sustainability) objectives agreed during scoping. This takes the form of a simple impact matrix and provides a quick indication of the problematic areas to decision-makers.

Impact matrices can be used as a basis for discussion, either between experts or with the

public, about the impacts of a strategic action and possible mitigation measures. They can be used as a presentation tool to summarise the results of more detailed studies about a strategic action's impacts<sup>20</sup>. Table 3.3 shows the simplest use of an impact matrix to identify and mitigate the impact of various sub-components of a strategic action.

If the proposal is detailed enough, the assessment will also include a detailed set of matrices which may use indicators and targets in assessing the environmental effects of the different alternatives (see also table 3.1 at paragraph 3.2.4). This can be accompanied by the use of GIS to provide a geographical illustration of certain effects, for example, on land and nature (see also the Fact Sheet 4.1 on the impact assessment tool). Finally, if the proposal is effectively a combination of major projects, which entails a high level of detail in terms of what is being proposed and where, SEA can make use of more detailed modelling. Boxes 3.19 and 3.20 in the following paragraph are an example of this type of level type.

### **3.3.3 Tools and techniques**

Impact prediction, evaluation and description in SEA have to be carried out making use of specific techniques and tools. Techniques used for the evaluation of the environmental effects are positioned between projects EIA and policy evaluation<sup>21</sup>. The SEA Directive asks for current knowledge to be employed. Thus current SEA practice<sup>22-23-24</sup> and other examples of evaluating environmental effects may be used as reference:

- GOMMS-WEBTAG [www.webtag.org.uk](http://www.webtag.org.uk)
- Netherlands Second Transport Structure Plan (STSP)

<sup>20</sup> Thérivel, 2004

<sup>21</sup> European Conference of Ministers of Transport- Strategic Environmental Assessment in the Transport Sector 1998

<sup>22</sup> Barry Dalal-Clayton and Barry Sadler Strategic Environmental Assessment (SEA): A sourcebook and reference guide on international experience. Final pre-publication draft 13 October 2004 <http://www.iied.org/spa/sea.html>

<sup>23</sup> Are we moving in the right direction? Indicators on transport and environmental integration in the EU: TERM 2000 Environmental issue report No 12 <http://reports.eea.eu.int/ENVISSUENo12/en/page036.html>

<sup>24</sup> SEA-reports by country: <http://www.onlinelearning.unu.edu/sea-version1/Resources/Reports/Sector/SEAreports%20by%20sector.htm>

- FITP Germany<sup>25</sup>
- The Transport Agencies' National Transport Planning Process Norway<sup>26</sup>
- France: Intermodal proposal for the A7/A9 route
- United Kingdom: setting forth-strategic assessment

Generally speaking, while in project EIA the more detailed and comprehensive the assessment, the better, this is not the case of a SEA. A typical strategic action may cover thousands of hectares, lead to hundreds of projects and last ten years or more. Moreover, both the time available and the financial resources allocated to carry out a SEA are generally rather limited. So, in these circumstances (large area, little/aggregated data, limited time, high uncertainty) the tools must fulfil some key requirements [Riki Therivel and Graham Wood 2005].

### **Typology of SEA tools**

Tools and methods used in SEA must fit a number of requirements (apart from being comprehensive and detailed) They should<sup>27</sup>:

- have low requirements regarding expertise of users
- not need further collection of primary data – being based on good data – using statistically efficient parameter estimation
- reflect the causal process in a comprehensive way– including “issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors”

- be discriminative, differentiating into plan or programme related and other impacts
- include sufficient Time and spatial dimension accounting for future or distant Impacts
- be commensurate and quantifiable indicators having reasonable elasticity
- employ credible and replicable methods and models accounting for uncertainties which can be validated and calibrated to different situations
- produce aggregated and communicable results comparing also to the do nothing scenario

### **A special attention to the transboundary issues**

Transborder plans require more attention on the

- coupling of scenarios/alternatives
- consolidation of the indicators sets and the weighting
- common objective functions and exposure thresholds
- trans-border data merging/preparation
- coupling of national demand simulation models

Also the scales for the indicators and the objective function in general may be on the agenda for trans-national projects. Relative biodiversity for example should be defined for different ecosystems.

Box 3-19 shows a possible assessment process that starts from the consolidation and weighting of the indicator set analysed in the scoping phase and ends with the final reporting, communication and decision taking activities.

<sup>25</sup> Planungsgruppe Ökologie und Umwelt, IPU Ingenieurbüro für Planung und Umwelt Umweltrisikoeinschätzung (URE) von Projekten zum BVWP 2003 Zusammenfassender Bericht

<sup>26</sup> Inger-Anne Ravlum NORWAY • INSTITUTE OF TRANSPORT ECONOMICS Comprehensive, common and transparent? The Transport Agencies' National Transport Planning Process Series: TØI report 488/2000

<sup>27</sup> Source: Minken Harald Institute of Transport Economics Oslo et al, Developing Sustainable Urban Land Use and Transport Strategies – A Methodological Guidebook, Prospects Procedures for recommending Optimal Sustainable Planning of European City Transport Systems 2003 p. 68

*In order to avoid a negative attitude of the proponents towards the other assessment it is recommended to conduct a joint assessment. This requires a:*

#### **Coupling of scenarios/alternatives**

- *Transboundary plans have to be coupled to form a reasonable network, this refers to the space and time domain i.e. tracks have to be linked and are fully effective only after they connect with each other.*

#### **Consolidation of the indicators sets and the weighting**

- *in a trans boundary approach different cultures are facing each other. Before commencing it is useful to define a common evaluation framework. If this does not seem to be possible tools might be used to use different weights to see how stable the results are. This might save time which would have been spend on mediation before having real results as basis for discussion.*

#### **Common objective functions and exposure thresholds**

- *starting with environmental targets the objective functions define the relationship between the effects and the final indicators. Exposure thresholds reflect the national legislation but may rely on WHO or European limits. Mediation may be necessary if special protection is given to parts of the population or cultural heritage.*

#### **Trans-border data merging/preparation**

- *Transboundary plan or programmes may be assessed only once by the two or more parties to save money but all of them should provide national data in an appropriate format.*

#### **Coupling of national simulation models**

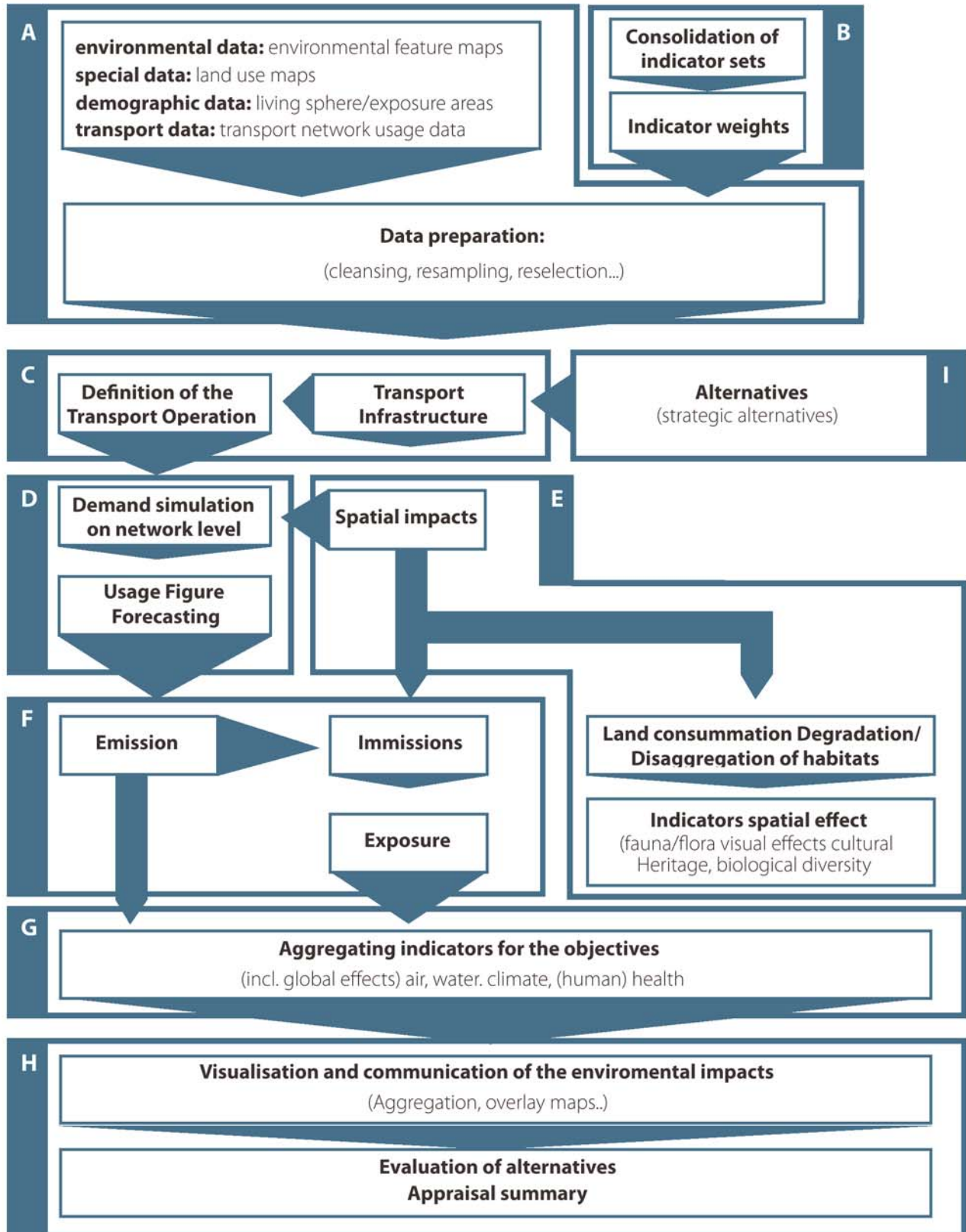
- *Transboundary infrastructure eases problems in transboundary transport and iterates the demand in the supranational network. If there are more connecting points and modes involved the national models should be coupled.*

The set of tools required to carry out the entire process (no single, comprehensive tool is available to cover the whole assessment process ) are outlined in box 3-12. Each of the tools listed in box 3-20 is associated to a specific step of the assessment process via a colour code and a letter.

The Fact Sheet 4.1 on "Impact Assessment Tools" describes in detail each of this tools, providing for each of them a short description, strengths and weak features, applications, examples and suppliers.

#### **3.3.4 Further reading**

- Commented SEA directive: Implementation of directive e2001/42/EC in the assessment of the effects of certain plans and programmes on the environment: [http://europa.eu.int/comm/environment/eia/030923\\_sea\\_guidance.pdf](http://europa.eu.int/comm/environment/eia/030923_sea_guidance.pdf)
- British Office of the Deputy Prime Minister and the Scottish Executive, the Welsh Assembly Government and the N. Ireland Department of the Environment, July 2004: Draft Practical Guide to the SEA Directive 2001/42/EC
- May et. al., Decision Makers Guidebook:



### Box 3 20: Tools used in the assessment process

Tool	Usage			Comments
Cause effect modelling	B			For non standard applications, cleansing of the indicator framework etc.
Screening - Ecological Risk Assessment Tools	C			If further developed may be serving as basis for simplified SEA
Transport Forecast Models	D			The crucial point for realistic impact quantification
Coupled land use/transport models	E			Just in its infancies but indispensable for long term plans and programmes
Air/Water quality/noise modelling and population exposure tools	F			Gaining ground with increased computer performance and existence of digital terrain models (DTM) and GIS in general.
Cost benefit Analysis	G			More pre-SEA if more focus on economy and less on environment
Life cycle assessment	F			For non standard applications with high energy investment in infrastructure and low infrastructure usage, normally dispensable
Intelligent GIS	A	E	H	May be the repository for a complete SEA but not necessarily - the more complex the simulation the less likely is that the complete SEA is based on a GIS system. On the other hand existing trans-border GIS supports the use of a GIS basis.
Decision support tools	G			Indispensable to incorporate non quantifiable impacts
Information Sharing, Group decision taking and Public involvement tools	H			Big asset but requires a clear vision to involve the public on a high level - must be accompanied by measures for computer illiterate citizens
Backcasting, Scenario techniques/Delphi, Multi Objective Optimization	I			Depending on the type of plan/programme either creativity techniques to define alternatives or an integrated modelling approach (trip generation, trip distribution, modal split, route choice) <sup>28</sup> is suitable.

Developing Sustainable Urban Land Use and Transport Strategies PROSPECTS (Procedures for Recommending Optimal Sustainable Planning of European City Transport Systems) 2003  
[http://www.ivv.tuwien.ac.at/projects/prospects/Deliverables/pr\\_del15dmgcn.pdf](http://www.ivv.tuwien.ac.at/projects/prospects/Deliverables/pr_del15dmgcn.pdf)

- European Conference of Ministers of Transport- Strategic Environmental Assessment in the Transport Sector 1998
- Barry Dalal-Clayton and Barry Sadler Strategic Environmental Assessment (SEA): A sourcebook and reference
- Guide on international experience. Final

<sup>28</sup> P Bakker, P Mijjer, Hague Consulting Group, The Netherlands; Updating the Netherlands national model Summary Advice on Modelling TAG Unit 2.4 [http://www.webtag.org.uk/webdocuments/2\\_Project\\_Manager/4\\_Summary\\_Advice\\_on\\_Modelling/](http://www.webtag.org.uk/webdocuments/2_Project_Manager/4_Summary_Advice_on_Modelling/)

pre-publication draft 13 October 2004  
<http://www.iied.org/spa/sea.html>

- Are we moving in the right direction? Indicators on transport and environmental integration in the EU: TERM 2000 Environmental issue report No 12 <http://reports.eea.eu.int/ENVISSUENo12/en/page036.html>
- SEA-reports by country <http://www.online-learning.unu.edu/seaversion1/Resources/Reports/Sector/SEAreports%20by%20sector.html>
- Planungsgruppe Ökologie und Umwelt, IPU Ingenieurbüro für Planung und Umwelt Umweltrisikoeinschätzung (URE) von Projekten zum BVWP 2003 Zusammenfassender Bericht
- Inger-Anne Ravlum NORWAY • INSTITUTE OF TRANSPORT ECONOMICS Comprehensive, common and transparent? The Transport Agencies' National Transport Planning Process Series: TØI report 488/2000
- DE JONG et. al RAND Europe, The Specification of Logistics in the Norwegian and Swedish National Freight Model Systems Model scope, structure and implementation plan TR-225-SIKA Project 04074 November 2004 [http://www.sika-institute.se/utgivning/modeller\\_specification\\_of\\_logistics.pdf](http://www.sika-institute.se/utgivning/modeller_specification_of_logistics.pdf)
- Munasinghe Mohan, Understanding the climate –development nexus: Using the Sustainomics framework – Intergovernmental Panel on Climate Change Geneva
- Lohani et. Al Asian development bank 1997 Environmental Impact Assessment for Developing Countries in Asia
- Minken Harald Institute of Transport Economics Oslo et al, Developing Sustainable Urban Land Use and Transport Strategies – A Methodological Guidebook, Prospects Procedures for recommending Optimal Sustainable Planning of European City Transport Systems 2003 p. 68
- Thérivel R. 2004: Strategic Environmental Assessment in Action. Earthscan, London
- Schmidt M. Joao E., Albrecht A (editors). Implementation of strategic environmental assessment. (Springer 2005)

## 3.4. REVIEW

### 3.4.1 Purpose

The main purpose of the review step is to confer SEA a quality check and safeguard its effectiveness, adequacy and continuing suitability.

The purpose of the review is to evaluate the positive and negative aspects of the framework for sustainability and the final draft of the plan or programme.

For environmental authorities, as well as for bodies with environmental responsibilities and expertise, and for the public, the review gives an opportunity to comment and reflect on the results and activities of the SEA.

The report review (see also Section 2) should ensure that, at the very least, the following questions are fully answered (see table 3-4):

- Does the SEA report address the issues raised in the scoping report?
- Does the SEA report show if the goals and environmental strategy are fulfilled?
- Is the SEA report user-friendly and unbiased?
- Does the non-technical summary fairly reflect the full SEA report?
- Are all the relevant issues, including alternatives, discussed and analysed?
- Are the forecasts and the associated methods presented clearly?
- Are the results of consultation duly taken on board?

### 3.4.2 How to review

#### **When:**

The review should be planned as early as in the SEA scoping phase. Major milestones and follow-ups (like activities and their effects) should be identified, and responsibilities accordingly assigned.

When defining the environmental strategy and goals, the review criteria should also be set in order to achieve consensus.

**Who:**

The review must be performed by independent experts.

Those who are responsible for the plan should also make sure that a review is performed and the result is communicated to relevant parties.

If the environmental impacts of the plan directly affect other countries, the relevant authorities therefore shall be involved in the SEA definition phase and in the review phase.

**Methods:**

In order to ensure objectivity in the SEA report review, one of the following criteria should be employed:

- Use of review criteria defined at the scoping phase
- Setting up an independent review body, possibly taking into account pre-defined profiles regarding for example knowledge, experience, responsibility and authority for those who review the SEA report
- Make the SEA report result public

**In addition, the following may be considered:**

- Action-specific scoping guidelines, where they are prepared, provide a valuable checklist for review.
- Results from existing EIA and their reviews (on project level) may serve as an important source of knowledge for the SEA.
- Comparison with commonly and legally accepted rules.
- Review groups involving responsible authority, other environmental authorities, environmental organisations, environmental professionals (consultants) and the public.
- Use of a panel of experts.
- Comparison with national/global environmental guidelines and targets, strategies and environmental objectives.

**Important**

- Be sure to involve all relevant parties in the review.
- Bodies and individuals involved in commenting the SEA report must be given a copy of the report and be allowed reasonable time to respond.
- From the review it should be possible to read the plan's content/meaning and impacts without problems.
- Make sure that the review is objective and that the results are made public.
- The various comments arising from reviews of the SEA report by consultants and by the public should be placed in the public domain.
- Consider the follow-ups and criteria already in the scoping in order to be able to make a useful review.
- Make it possible to use the review result as input to other SEA and other relevant environmental activities (legislation, recommendations, guidelines etc.).

**3.4.3 Further reading**

- Environmental assessment of plan and Programmes, Nordic experiences in relation to the implementation of the EU directive 2001/41/EC, NORDREGIO 2003
- Regional Workshop Review, Szentendre, May 2001, SEA activities, the regional environmental Centre for central and eastern Europe
- Strategic Environment Assessment in South Africa, 2000, ISBN-0-621-29925-1
- Impel Project: Implementing article 10 of the SEA, Directive 2001/42/EC
- [www.unece.org/env/eia/eialinks.html](http://www.unece.org/env/eia/eialinks.html)
- European Commission, 1994a. EIA Review Checklist. Directorate-General XI, Brussels. (This is an easy-to-use guide, which contains a comprehensive set of review criteria. It is adaptable to apply to SEA reports as well as EIA reports.)
- Lee, N. and Colley, R., 1992. Reviewing the Quality of Environmental Statements. Occasional Paper 24, Department of

### Box 3 21. Review of the Italian HSR Milan-Bologna SEA report

*The SEA of the Italian High Speed Railway Milan-Bologna was reviewed and evaluated by the EIA Commission of the Ministry of Environment. The Commission approved the SEA upon the condition that certain requirements would be included in the detailed project design. These were specific requirements derived from the SEA report. They included noise barriers, measures to mitigate or compensate ecological impacts, as well as project issues, such as route selection, viaducts, hydraulics, construction sites, monitoring, project costs and construction management.*

**Table 3 4. Review criteria for presentation of information in an SEA report**

<b>Criterion</b>	<b>Relevant (Yes/No)</b>	<b>Judgement (qualitative ranking)</b>	<b>Comment</b>
Has information and analysis been offered to support all conclusions drawn?			
Has information and analysis been presented so as to be comprehensible to the non-specialist, using maps, tables and graphical material as appropriate?			
Are all the important data and results discussed in an integrated fashion within the information?			
Has superfluous information (i.e. information not needed for the decision) been avoided?			
Have prominence and emphasis been given to severe adverse impacts, to substantial environmental benefits, and to controversial issues?			
Is the information objective?			
Has been different alternatives (including the "non"-scenario) been analysed and compared?			
Have the remarks provided by external authorities and general public been taken into account			

Source: European Commission, 1994a

Planning and Landscape, University of Manchester, 2nd edition.

- Using the results, Review 52, Manual on Strategic Environmental Assessment of Transport Infrastructure Plans (This publication contains review criteria which enable a judgement to be made about the overall quality of the SEA report. The criteria were designed for EIA reports, but can be adapted to be used for SEA reports.)
- Integration into planning and decision-making 53, Manual on Strategic Environmental Assessment of Transport Infrastructure Plans



### 3.5. IMPLEMENTATION AND MONITORING

*The SEA process should be linked with plan implementation, to ensure that its effects are monitored and to enforce and adjust the decision where necessary. Read this chapter to discover how this can be done.*

#### 3.5.1 Purpose

According to article 10 of Directive 42/2001/EC, "Member States shall monitor the significant environmental effects of the implementation of plans and programmes in order, inter alia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action". Monitoring can be described as an activity of following the development of the parameters of concern in magnitude, space and time.

Implementation and monitoring phases may determine, among others:

- SEA / EIA screening criteria for decisions at lower tiers. For example, when a SEA provides insufficient guidance for further planning, an EIA may be required for the detailed design stage (which would not normally be necessary).
- Guidance for scoping at lower tiers, including the weights that certain impacts should have in plan development, and how mitigation should be ensured. Specific environmental indicators may be highlighted (for example visibility and noise) also to be a follow-up as a part of the approved transport infrastructure plan.
- How the administrations responsible for implementation should report to the higher tier administrations on the implementation of the environmental action and monitoring plan.

How the impacts arising during and after construction works are monitored and reported, the role of consultants and the public, and the actions that should be taken if the impacts are different from those forecast in the SEA report. The indicators chosen should be those already being monitored but, where necessary, additional, easily monitored, indicators may need to be selected. These should be meaningful and appropriate for the level of decision-making

involved (national or local). An example from the High Speed Railway, Milan – Bologna is presented in Box 3-22. Some of these actions may also be part of lower-tier environmental action and monitoring plans, if they are not already included at this level.

In the case of the Italian High Speed Railway, Milan-Bologna, the EIA Commission of the Ministry of the Environment evaluated the SEA prepared at the basic engineering level. The evaluation stated that environmental monitoring was mandatory during implementation. Environmental monitoring both in the construction and operation phases proved very useful in negotiations with local authorities to obtain building permits. The local authorities considered monitoring as a guarantee of avoiding damage to the environment. Municipalities showed a more positive attitude when they knew that the environmental impacts were going to be monitored, and that there would be a bank-guaranteed fund to pay for corrective measures if they proved necessary.

#### 3.5.2 How to monitor

##### **When**

The environmental monitoring and action plan is preferably specified (if only as a preliminary, high level outline) during the scoping phase. Once a transport infrastructure plan has been formally approved, it is normally implemented. It forms a framework for further (lower tier) planning and decision-making, and eventually for projects. The impacts at project level can be influenced by the original transport infrastructure plan. It can do so not only by choosing strategic alternatives for the transport infrastructure, but also by ensuring that, during implementation, environmental impacts are accounted for in an appropriate manner.

This involves the formulation of an environmental action and monitoring plan. This should be developed during the SEA process and included in the SEA report (see Section 2). The environmental action and monitoring plan should make explicit reference to all the environmentally significant objectives of the transport infrastructure plan.

Decision-makers should adopt the environmental action and monitoring plan as a pre-condition for the approval of transport

*In the case of the Italian High Speed Railway, Milan-Bologna, the EIA Commission of the Ministry of the Environment evaluated the SEA prepared at the basic engineering level. The evaluation stated that environmental monitoring was mandatory during implementation. Environmental monitoring both in the construction and operation phases proved very useful in negotiations with local authorities to obtain building permits. The local authorities considered monitoring as a guarantee of avoiding damage to the environment. Municipalities showed a more positive attitude when they knew that the environmental impacts were going to be monitored, and that there would be a bank-guaranteed fund to pay for corrective measures if they proved necessary.*

infrastructure plans, to reduce the uncertainties that exist at the time of approval.

It can do so by:

- checking the implementation of the transport infrastructure plan and indicating where the plan needs to be adjusted;
- ensuring that appropriate corrective actions will be taken in the case of unexpected impacts or aberrations;

allowing the 'strategic' decision-makers the opportunity to verify whether lower-tier plans, prepared and approved at other levels of administration, comply with the environmental action and monitoring plan.

### **Who**

Article 10 of the SEA directive does not determine which authority or body is responsible for monitoring. This depends on the individual situation, notably in regard to the respective administrative system and structure. A monitoring group can be established with representatives of the concerned bodies, authorities or organisations.

When designing a monitoring framework, it has to be decided whether the tasks should be performed by the same authority/body or by different authorities/bodies. It is also necessary to determine the relationship between the authority/authorities responsible for monitoring or several monitoring tasks and the planning authority. It may even be appropriate to involve private organisations in the activities connected with the collection of environmental data.

It is important to determine roles that should initiate, maintain and report the monitoring plan. These role descriptions should preferably be incorporated in the description of the SEA.

Monitoring arrangements may cover several plans, e.g., within the same thematic category, spatial boundary or on different levels in the planning hierarchy. To facilitate a more coherent and collaborative approach to monitoring, sharing and dissemination of data is to be encouraged.

Monitoring should provide a feedback mechanism, linking with the baseline to inform the next plan and its assessment, and identifying gaps or inaccuracies in assessment to improve the quality of future assessment.

### **How**

The procedure of monitoring may be split into several tasks, comprising the collection of environmental information, the processing of information and the interpretation or evaluation of this information.

Significant environmental effects can be monitored directly and/or indirectly. Monitoring may be integrated in the planning cycle and coincide with the regular revision of a plan or programme.

Appropriate monitoring procedures need to be considered and reported for each plan. The scope, depth and way of monitoring depend very much on the characteristics of each type of plan or programme. Art. 10 leaves flexibility to develop flexible and individual solutions adapted to the respective type of plan or programme.

New or separate monitoring for each plan will not always be necessary. Plan makers may draw upon existing monitoring arrangements to compile the necessary information, avoiding duplication of effort.

Monitoring is closely linked with the environmental report which has to be prepared

*In The Netherlands, the Transport Structure Plan 2 has an associated yearly monitoring programme, which is used to feed back into the policy process (adjusting the TSP-2). The following indicators are monitored at national level:*

### *'Liveability'*

- *emissions by traffic*
- *noise nuisance*
- *number of casualties (dead / wounded / hospitalised)*
- *severance*
- *shipping accidents*

### *'Mainport' strategy (related to major international transport ports (e.g. Port of Rotterdam))*

- *air passengers and freight, modal split to and from international airports*

### *Competitive transport*

- *freight traffic market shares (road, inland shipping, marine, ports)*

### *Selective accessibility in a sustainable society*

- *frequency of congestion*
- *support for the Transport Structure Plan 2 and awareness of its targets*

### *Reduction of growth and distribution of road traffic*

- *municipalities with an active parking policy*
- *occupancy rate of personal cars kilometres of bicycle tracks*
- *passenger-kilometres by public transport*
- *lorry-kilometres*
- *inter-modal traffic*

### *Freight transport*

- *volume of rail freight transport, volume of inland shipping, volume of short-distance sea container traffic*

### *Individual mobility*

- *traffic management*
- *relative travel times by private car and by public transport*
- *trains with delays*
- *profitability of city and regional bus transport*

*Quantitative policy targets are set for these indicators, based on a general assessment (including an environmental assessment). If the targets are reached too slowly, the policies are adjusted. This results in continuous improvement of policy in relation to transport, which also has repercussions for infrastructure planning. On the other hand, transport infrastructure planning itself is driven more by discussions about irreversible impacts than by the impacts which can be abated by adjusting transport and environmental policy.*

*Source: Ministry of Transport, Public Works and Waterways, 1997.*

according to art 5. of the SEA directive. To this end the environmental report should provide the baseline environmental information that is relevant for monitoring the significant environmental effects of plans and programmes.

Finally it is worth noting that the SEA Directive requires that a description of the monitoring measures must be contained in the environmental report and made publicly available. The monitoring measures and their results have to be made available on request<sup>29</sup>.

### **Corrective actions**

Corrective actions can be initiated for improving monitored environmental impacts after the construction of the transport infrastructure, trying to mitigate, at least, the pressures on the environment caused by traffic (impacts which are caused by the physical presence of the infrastructure are often irreversible after the construction of the infrastructure itself). Appropriate corrective action following the construction phase may be, for instance:

- Action specific to the planned infrastructure connections: speeds, mitigation measures such as noise barriers, and traffic management. (the need for such action can be identified in the SEAs for the connections.);
- Action related to more general transport policy, environmental policy (emission standards), spatial policy, or fiscal policy, which affects the whole infrastructure network, including the existing connections.

In order to identify the most appropriate corrective action, monitoring of the effects following construction should therefore be part of a network-wide monitoring programme, and corrective action should generally be developed at network scale rather than at the connection level. In this way, for example, it is possible to set priorities between different 'black spot' location solutions by, for example, construction of new infrastructure, or decommissioning of existing infrastructure. An example of network-wide monitoring in The Netherlands is shown in Box 3-15.

### **Methods**

Monitoring in a SEA context should be organised at network level so that actions that are likely to have effects on the whole network, such as setting emission standards, decommissioning infrastructure or constructing new infrastructure, can be taken.

Pre-existing monitoring arrangements may be used if appropriate, with a view to avoiding duplication of monitoring. This means that the information on the effects of plans and programmes does not have to be collected specifically for this purpose, but other sources of information can be used.

The SEA Directive does not contain any specific requirements for what concerns the monitoring methods like use of common or minimum standards, nor the frequency of monitoring. The appropriate standards and intervals should be examined carefully in the design of the monitoring scheme and, in particular:

- there should be standards and defined methods on how to communicate and present the monitoring results;
- the monitoring should be linked with plan implementation in order to safeguard that its effects are monitored and to enforce and adjust decisions when necessary;
- the monitoring can be adjusted as the plan develops.

A key task is the appropriate selection and use of indicators to ensure an effective and sufficient monitoring. Indicators may often be used for monitoring of environmental effects of the implementation of plans and programmes. To this end it should be worth considering a specific authority or body to be responsible for certain tasks of monitoring in order to avoid duplication of efforts by multiple authorities and to ensure some common or minimum standards. Such an authority could for example be responsible for the selection of indicators.

The OECD has developed a framework for the work with indicators which consists of three components: pressure indicators, state indicators and response indicators Another example of

<sup>29</sup> Council Directive 90/313/EEC of 7 June 1990 on the freedom of access to information on the environment, OJ L 158 23.06.1990, p.56.

Indicators used in the DPSIR scheme	What the indicators describe
Indicators for driving forces	Social, demographic and economic developments in societies and the corresponding changes in life styles etc.
Pressure indicators	Developments in release of substances, physical and biological agents, the use of resources and the use of land.
State indicators	The quantity and quality of physical, biological or chemical phenomena in a certain area.
Impact indicators	Which impact that results from the driving forces
Response indicators (mitigation measures)	Responses and attempts by groups, individuals and authorities in society to prevent, compensate, ameliorate or adapt changes in the state of environment.

methodological background can be given by the DPSIR<sup>30</sup> -scheme developed by the EEA<sup>31</sup> (see also box 3-9 of paragraph 3.3.2.) which uses a cause-effect-approach. Even though originally designed for use in policy-making, the different aspects addressed therein are also of relevance for monitoring environmental effects in the context of plans or programmes. The indicators used in the DPSIR approach aim at detecting problems in the current situation and near future, finding out what the current situation is and comparing it with earlier monitoring results.

### ***In conclusion***

- Use relevant indicators to detect and measure changes in environment
- Use monitoring results and the analysis of them, as input to other SEAs.
- Arrangement for transboundary consultation may also address monitoring.
- Use updated information
- Have an updated summary of the monitoring status prepared for authorities and decision makers
- Audit the effectiveness of the plan or programme in the light of implementation
- Ensure that appropriate corrective action will be taken in the case of unexpected impacts or aberrations;

- Allowing the 'strategic' decision-makers the opportunity to verify whether lower-tier plans, prepared and approved at other levels of administration, comply with the environmental action and monitoring plan.
- Ensure that a description of the monitoring measures is made publicly available in the environmental report.

<sup>30</sup> Driving Forces, resulting environmental Pressure, the State of the environment, Impacts resulting from changes in environmental quality, the social Response to these changes in environment.

<sup>31</sup> European Environmental Agency. Environmental indicators: Typology and overview. Technical report Nr 25 (1999).

### 3.5.3 Further reading

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- SEA and Transport planning Newspaper, UK
- Strategic Environment Assessment in South Africa, 2000, ISBN-0-621-29925-1
- Environmental assessment of plan and Programmes, Nordic experiences in relation to the implementation of the EU directive 2001/41/EC, NORDREGIO 2003
- [www.unece.org/env/eia/eialinks.html](http://www.unece.org/env/eia/eialinks.html)
- Arts, J. and Nootboom, S. G., forthcoming. Monitoring and auditing. In: Petts, J. (ed.) Handbook of Environmental Impact Assessment. Blackwell, Oxford. (Gives an overview of current methodology and legislation concerning EIA and SEA monitoring and follow-up. Highlights different types of monitoring, the links between the environmental assessment process before and after formal decision-making, and relates the instruments of EIA and SEA to other instruments of environmental policy, such as ex ante and ex post evaluation, environmental permitting and environmental auditing.)
- European Conference of Ministers of Transport, 1997. CO<sub>2</sub> Emissions from Transport. ECMT, Organisation for Economic Cooperation and Development, Paris. (Presents the results of an in-depth survey of CO<sub>2</sub> emissions from transport in member and associate member countries. It includes effects on CO<sub>2</sub> emissions from the transport sector, disaggregated to subsector level, of transport policy actions either in effect or planned to limit CO<sub>2</sub> emissions. The study examines the requirements of a monitoring system and current data sources.)
- The European Environment Agency in Copenhagen regularly publishes integrated environmental assessments which include chapters about the environmental pressures caused by the transport sector.
- Council Directive 90/313/EEC of 7 June 1990 on the freedom of access to information on the environment, OJ L 158 23.06.1990, p.56.

## 3.6. CONSULTATION AND PARTICIPATION

### 3.6.1 Why consultation and participation?

#### ***Why consultation of affected groups and the public is essential in SEA***

Consultation is provided for in article 6 of the SEA Directive, which requires consultation of environmental authorities and the public on the draft plan or programme and the environmental report. In addition, environmental authorities must be consulted when Member States determine the environmental significance of plans and programmes (whether through case by case screening or by specifying types of plans or programmes [see article 3(6)] ), and when they carry out scoping [article 5(4)]. Other Member States likely to be significantly affected by the implementation of a plan or programme must also be given the opportunity of being consulted.

In article 6, the SEA Directive establishes the difference between, on the one hand, the public in general, which has the right of access to the draft plan or programme [Art. 6(1)] and, on the other hand, a subset of the public in general, i.e. the public which has the right to express its opinion on the draft plan or programme and on the accompanying environmental report [Art. 6(2)]. It is up to the member states "to identify the public for the purposes of paragraph 2, including the public affected or likely to be affected by, or having an interest in, the decision-making subject to this Directive, including relevant non governmental organisations" [Art. 6(4)]. The difference between "affected" and "not affected" or even "having an interest in" and "not having an interest in", may be difficult to pinpoint objectively, and the German Federal Building Code and the Federal Spatial Planning Act, for instance, do not consider it explicitly. In such cases, it can be assumed that public participation means "participation of everyone".

Besides that, the question is discussed, whether it is necessary to enlist all members of the public in general or whether it is sufficient to enlist representatives, such as associations or NGOs. The supporters of "representative participation" refer to the high costs of "general participation", whereas the supporters of the latter emphasize that representative participation alone does not fulfil the requirements of the SEA Directive. Also the quality of the required information and the results of the SEA may be

negatively affected if only a few selected actors have the opportunity to participate. According to Sheate et al. "widespread involvement of stakeholders, policy makers and the wider public is crucial for successful SEA".

The following list shows which government and public groups should be consulted and invited to participate in an SEA

- governments:
  - the competent authority;
  - national, regional and local authorities and organisations responsible for environmental protection, nature conservation, heritage, landscape protection, land use (spatial) planning and pollution control;
  - sectoral governmental organisations which may be affected, such as agriculture, energy, fisheries, forestry;
  - international agencies, e.g. those responsible for the designation of areas of international importance;
  - governments and organisations in adjoining countries.
- the public:
  - local community representatives, landowners and residents' groups;
  - groups representing users of the environment (e.g. farmers) and research institutes;
  - employers' and employees' organisations;
  - NGOs;
  - users of transport infrastructure;

How to undertake consultation and participation?

### **Methods of consultation of affected groups and the public**

The SEA Directive does not include explicit statements concerning the concrete procedure to be adopted for the consultations, it just names requirements on the procedure as mentioned above. Therefore MS have the opportunity to

design the participation process in very different ways. In any instance, the mere compliance with, or a narrow interpretation of the SEA Directive may not be sufficient to reap all the potential benefits of public participation. Moreover, participation, understood as mere information of the public and as dutiful ticking off the expressions of opinion does therefore not allow to fully achieve the requirements of the SEA Directive and, on the other hand, if the expressions of opinions do not affect the strategic action at all, the public will be led to believe that participation is only an "alibi-participation" (lip service), which is neither effective nor worthwhile. Successful SEA is an active, participatory and educational process for all parties, in that stakeholders are able to influence the decision-maker, and the decision-maker is able to raise awareness of the strategic dimensions of the policy, plan or programme"<sup>32</sup>.

The "strong" moments in which consultation and public participation should take place are (i) the production of the scoping report (see Section 2 paragraph 2.3.2) and (ii) the production of the draft version SEA report. The consultation on the scoping phase may be restricted to environmental authorities and specialized agencies or NGOs while the discussion of the SEA draft report must be extended to the general public.

To concretely disseminate the information and reach the target groups, specialised agencies may be entrusted to facilitate the circulation of draft documents and organise venues where debates and verbal communication (e.g. bilateral meetings, round-table meetings and informal discussions) can be appropriately developed. Despite the agencies' technical competence within their own fields, to elicit meaningful and usable responses it is mandatory that the documents circulated are as user-friendly as possible, entailing clarity of language, pleasant visual layouts, etc. A major case in point is the non-technical summary of the environmental report (see annex 1 to the SEA Directive)

Requirements concerning publication and dissemination of the plan or programme and the environmental report are:

- Informing affected groups
  - Printed material (brochures, displays and

<sup>32</sup> Sheate et al.

exhibits, direct mailing)

- Utilisation of all helpful means of dissemination, including public media and internet
- Easy and cheap availability of the documents, for example by internet-download
- Public information sessions (open houses, site visits, field offices)
- Listening to the opinions of the public:
  - surveys (interviews with key people, polls and questionnaires);
  - large meetings (public meetings, public hearings, conferences).
- Direct participation of the public (or agencies):
  - small meetings (public seminars, focus groups);
  - advisory groups (e.g. task forces);
  - problem solving techniques (e.g. brainstorming, simulation games);
  - consensus building techniques (e.g. Delphi process, arbitration).

Finally, it is recommended to prepare an external communication plan at the outset of the SEA process, as is commonly done, for example, in The Netherlands. Such a plan should define the stages, objectives and methods of, and responsibilities for, communication throughout the SEA process. It should include the preparation of a record of decision including how public and agency inputs to the SEA were taken into account. It is often difficult to involve large groups that are affected by strategic decisions, in particular when specific locations have not yet been selected. In such cases, the contribution of non-governmental organisations (NGOs) may be particularly important and groups that operate at the appropriate geographical level should be consulted. For example, in network plans at the national level, national NGOs should be involved. However, if plans that are relevant to identifiable regional or local areas are made at national level, groups in these areas should also be consulted. Some suggestions about methods of communicating with the public are presented in Table 3-5. There have been some notable public participation exercises in SEA. That for the Milan-Bologna High Speed Railway is described in Box

3-24 and the nationwide involvement of the public in the extension of the Port of Rotterdam is presented in Box 3-25. It is important that public input should be acknowledged. Thus, any suggestions made about the scope of the SEA should be responded to. Similarly, comments on the SEA report, and how they are taken into account, should be set down in a record of decision on the proposal.

### 3.6.2 Further reading

- Bina, O. (2001) Strategic Environmental Assessment of Transport Corridors: Lessons learned comparing the methods of five Member States, final report by Environmental Resources Management for DG Environment, January 2001. European Commission, Brussels (also available at <http://europa.eu.int/comm/environment/eia/sea-support.htm>).
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- Dalal-Clayton, B. and Sadler, B. (2004) Strategic Environmental Assessment: A sourcebook and reference guide to international experience, IIED and Earthscan, available at: [http://www.iied.org/spa/sea.html#chap\(22/2/05\)](http://www.iied.org/spa/sea.html#chap(22/2/05)), London.
- EC (2002) Communication from the Commission on the Collection and Use of Expertise by The Commission: Principles and Guidelines, European Commission, Commission of the European Communities, Brussels, 11/12/02 COM(2002)713final, available at [http://europa.eu.int/comm/governance/docs/comm\\_expertise\\_en.pdf](http://europa.eu.int/comm/governance/docs/comm_expertise_en.pdf) (15/11/04).
- ECMT (Ed.) (2004) Assessment and Decision Making for Integrated Transport and Environment Policy, European Conference of Ministers of Transport/OECD, Paris.



- Nilsson, M. (2005) Learning, frames and environmental policy integration: the case

of Swedish energy policy, Environment and Planning C: Government and policy.

### Box 3 24 Public participation in the Italian Milan-Bologna HSR corridor study

*The experience of the Italian Milan-Bologna High Speed Railway shows that public participation is useful at strategic level. Public participation at corridor level, following careful preparation, created agreement on the project and speeded up the approval process for the railway. Local authorities were aware of the great economic importance of the project at the national level, but were worried that it would have little advantage for the region. They were also concerned about the loss of property values and possible restrictions to land use. During the public meetings a Not In My Backyard (NIMBY) syndrome emerged, and local groups were organised against the new line. Consultation had started with local authorities involved in the building permit procedure, as well as with the public. The local authorities were under pressure from the population, but also from the agricultural organisations. Several environmental studies were prepared with different purposes, such as studies for all the 50 or more rivers the line crosses to find solutions satisfying nature preservation targets and guaranteeing safety requirements, detailed studies of the construction phase and comparative studies of the alternative route studies. The study of the alternative routes for part of the line around the town of Modena was undertaken in close cooperation with the municipalities. The municipalities involved set up a commission of experts to analyse the routes by weighting and rating several criteria. Comparative studies were developed to discuss the advantages and disadvantages of each alternative with administrators and local communities. In parallel to this work, an extensive information campaign was conducted through discussion with people, presentation to associations and debate at the municipal council. Each alternative was presented at public meetings, where special attention was paid to clear communication and to restricting discussion to the important issues only. In the public meeting simplified thematic maps, visual simulation drawings, diagrams, histograms and carefully selected environmental indicators were used. These helped to maintain public concentration on the comparison exercise and to avoid NIMBY attitudes during the public meetings. The route selection for the high speed railway involved the whole city and the local newspaper reported daily. Environmental studies proved to be very helpful during the negotiations to obtain the building permits from municipalities. First, they helped to overcome initial opposition due to their communicative approach. Local administrators preferred to discuss environmental studies rather than technical reports using difficult terminology, complex maps and technical drawings. Technical solutions were also presented within a wider framework, which included transportation, urban planning, land use development and environmental preservation issues. Some of the environmental studies included accurate land use and site analysis, especially where the proposed railway was close to urban area. Second, environmental studies were used to find solutions, when different requirements were in conflict, such as between nature preservation and safety requirements. Conflict between the different authorities could have stopped the permitting procedure.*

Table 3 5: Suggestions for public participation in corridor studies

DOs	DONTs
indicate the boundaries of plan development	create any unworkable expectations
only start the planning/assessment process if the outcome is genuinely open	apply interactive planning to achieve a hidden agenda
involve all relevant parties in the process	allow interference in the agreed process
include explicit evaluation steps in the process	allow governments to represent affected groups
keep to the agreed time schedule	start the process without careful preparation
keep all input to the process authentic	mix different steps in the process
show involved parties their input on paper	limit communication to a presentation of the evaluation results
detach people from their fixed patterns of thinking	always use well-known solutions
communicate in understandable terms in a way that appeals to individuals	gather large anonymous groups

### Box 3 25 Public participation in determining the need for an extension to the port of Rotterdam, The Netherlands

*In 1996, a decision was made to construct a new freight rail line from the Port of Rotterdam to the German hinterland (Betuweroute). The SEA for this line was heavily criticised because, whilst the environmental impacts were assessed in sufficient detail for that level of decision-making, the economic necessity of the line was never properly demonstrated. At the same time, the Rotterdam port authorities initiated decision-making about an extension of the reclaimed port area Maasvlakte. To prevent the mistake that was made with respect to the Betuweroute, a national discussion was organised in The Netherlands to determine the need for an extension of the Port of Rotterdam. Decision-making was initiated by a proposal developed by the port authorities. During a time span of one year, public discussions were organised throughout the whole country about the desirability of an increase of freight transport and the locations where this could take place. The result was the following decision by the Cabinet: o that extension of port capacity, considering the benefits and the environmental impacts of such an extension, was necessary; o that certain Dutch ports were excluded as potential locations. However, Rotterdam could not be designated as the only feasible option. Antwerp was one of the alternatives to be studied; o that the possibility of making more efficient use of the existing port area should be studied. The cabinet decision served as input for a new SEA, in which a number of strategic alternatives could now be excluded from the analysis. The discussion' of need followed an approach that had been proposed by the Scientific Council on Government Policy (1994) in advice to the government about the planning of large projects. These discussions were to lead to an 'inception decision' for a corridor SEA. The discussion of need followed a so-called open planning process, where the participants (the general public and organised groups) generate planning proposals and evaluation criteria. The most important techniques used for participation were large and small meetings, telephone and written questionnaires, provision of information brochures and Internet discussions. This 'need and necessity' discussion was evaluated by a high-level committee, which concluded that the open planning process had been only partly successful and could have been improved in many ways. It identified particular weaknesses in the organisation of the process as a whole, in the development of the objectives and in the sequential rejection of alternatives.*



## Glossary

<b>accessibility</b>	time and cost needed for passengers and freight to move from origins to destinations, and general quality of the transport connection
<b>agency</b>	a governmental organisation
<b>alternatives</b>	Feasible policy, plan or programme options that are assessed in terms of their ability to meet economic, social and environmental objectives
<b>biodiversity</b>	the variety of life on earth; biodiversity can be described in terms of genes, species and ecosystems: sustainable development depends on understanding, protecting and maintaining the world's many interactive ecosystems
<b>corridor</b>	the area between two urban centres, airports, ports or other fixed poles of traffic attraction (e.g. border crossings), between which traffic flows occur
<b>decision maker</b>	the body or persons responsible for deciding whether an infrastructure plan should proceed: normally a function of government
<b>environmental impact assessment</b>	a procedure, in EU member states conducted according to the requirements laid out in Directive 85/337/EEC (and 97/11/EEC), assessing the environmental impacts of certain public and private projects which are likely to have significant effects on the environment
<b>geographical information system</b>	computerised database of geographical information which provides a platform for its management, analysis and illustration: by allowing information databases to be associated with real geographical information, GIS provide powerful analytical tools
<b>guidance</b>	a formal or informal document, supporting the effective application of SEA
<b>indicator</b>	forecastable quantitative or qualitative variable, normally including a target value representing an objective which is able to portray environmental or other impacts of transport infrastructure PPPs effectively
<b>induced traffic</b>	traffic generated by the availability of new transport infrastructure
<b>mitigation</b>	action taken to prevent or minimise the actual or potential adverse impacts of a policy, plan, programme or project
<b>mode</b>	a form of transport (such as road, rail, air, inland water shipping, marine shipping, pipeline, bicycle)
<b>monitoring</b>	the process of following up SEA conformance and performance
<b>multimodal</b>	considering more than one mode of transport
<b>network</b>	a number of interconnected, normally multi-modal links within a defined area
<b>node</b>	a location where different transport connections come together
<b>objectives</b>	a more clearly defined aim
<b>plan</b>	in transport SEA, a planning document of either network or corridor level
<b>policy</b>	in transport SEA, a document that identifies a portfolio of tax, regulatory, organisational and other measures that may be taken in order to meet certain objectives
<b>project</b>	construction, modification and/or operation of transport infrastructure
<b>scenario</b>	different possible ways of future development, normally connected to economic and population growth
<b>scoping</b>	deciding which issues should be considered in an SEA

**screening** deciding whether an SEA is required

**strategic environmental assessment**

Strategic environmental assessment (SEA) is a systematic, pro-active and participative process that aims at ensuring environmental aspects are given due consideration in decision making above the project level, frequently referred to as 'strategic action' or 'policies, plans and programmes (PPPs)'

**target a quantified objective**

tiering systematic tiering takes place between policies, plans and programmes, administrative tiering takes place between national, regional and local levels, both not necessarily in a strict top-down manner

**traffic flows**

passengers and freight moving from origins to destinations, and characteristics such as transport mode, speed, time of the day, number of vehicles

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