# "Going Dutch": a quick scan approach to EIA-follow up

Roel Nijsten and Jos Arts
Transportation/EIA-Centre, Rijkswaterstaat
Ministry of Transport, Public Works & Water Management
PO Box 5004, 2600 GA Delft, The Netherlands
Phone: ++31 15 2518343 / ++ 31 15 2518461
E-mail: r.j.m.f.nijsten@dww.rws.minvenw.nl / e.j.m.m.arts@dww.rws.minvenw.nl
Paper 24th Annual Meeting of the International Association for Impact Assessment
24 - 30 April 2004, Vancouver, Canada

## 1. Introduction

During the last decade, the Ministry of Transport has prepared and carried out many road projects in the Netherlands. In general, an Environmental Impact Statement (EIS) is prepared for the determination of the route (the alignment of the road) and the manner of construction, especially as road projects may have considerable impacts on the environment. The Dutch regulations for Environmental Impact Assessment (EIA) contain a requirement to conduct monitoring and evaluation of the environmental impacts of an EIA project during and/or after its implementation – *EIA follow-up*. To meet this requirement and to implement it in practice the Dutch Ministry of Transport has prepared its own 'guidelines for EIA follow-up of road projects' (see V&W, 2003; Van Lamoen & Arts, 2002). As follow-up may require a substantial amount of effort and money (both for the follow-up study itself and eventual remedial measures) the Dutch Ministry of Transport has carried out a *quick scan analysis* for EIA follow-up to investigate what the consequences would be of implementing these guidelines.

The objective of this paper is to present and discuss this quick scan approach to EIA follow-up. This pragmatic approach proved to be a useful and cost-effective avenue to monitor and evaluate several road projects in the Netherlands. It is believed that this so-called quick scan approach could be of interest to other EIA follow-up practitioners abroad. To this end, the paper first provides some background information about EIA follow-up in the Netherlands and the guidelines for EIA follow-up of roads. Subsequently, the quick scan approach is explained. Important elements are: a strict focus, use of existing information (monitoring), qualitative analysis (use of expert judgement, common sense), use of a workshop process (with practitioners, experts and decision-makers) and a short time-frame (3 months). This approach is illustrated by discussing the three projects for which the Dutch Ministry of Transport has carried out a quick scan. The results of these cases will be reviewed as well as the lessons learned for EIA follow-up within the Ministry of Transport. Of special importance here is the internal 'policy' toward EIA follow-up and the practicability of its guidelines for EIA follow-up. Finally, the paper discusses the lessons learned relevant to practitioners (both within government and industry) around the world. It is felt that the usefulness of such a pragmatic quick scan approach to EIA follow-up relates to such issues as:

- procedure – simple stepwise approach (framework), clear division of roles, tasks and responsibilities;
- process and organization – quick, cost-effective, open communication between parties, mutual learning; and
- content – scoping, 'early warning device' for potential environmental and methodological problems.

## 2. EIA follow-up for road projects in The Netherlands

The *requirement* for EIA follow-up is laid down in the Dutch Environmental Management Act (EMA, VROM 1996). All projects for which an EIS has been prepared in the Netherlands must be evaluated during or after implementation as stated in the EMA (s7.39):

> 'The competent authority that has taken a decision, in the preparation of which an environmental impact statement was drawn up, shall investigate the effects of the activity concerned on the environment, either during or after its completion.'

The *objectives* of EIA-follow up can be deducted from the Dutch regulations:

- controlling (checking and taking adjusting actions) – checking whether the real effects of the projects are within the bounds of the decision, expectations and predictions of the EIS; taking adjusting actions to remedy negative impacts on the environment (a management response);
- learning (knowledge) – getting better insight in the adequacy of environmental impacts predictions useful for project management or for future EIAs and scientific and technical knowledge; and

- informing (communication) – externally: informing other parties (e.g. the public) about the environmental performance of the project and thereby improving public awareness and acceptance; internally: informing for integration with other, existing information (streamlining).

These objectives are closely related to that of EIA itself – i.e. providing information about environmental impacts in order to reduce uncertainty and to enable more rational decision-making (Morrison-Saunders & Arts forthcoming).

The formal *procedure* of this EIA follow-up is quite simple (EMA, s7.37 and s7.39-7.43) and much of it is done in parallel with the EIA process (for a discussion in detail see Arts, 1998). There is no screening for the need for follow-up as s.7.39 EMA states that EIA follow-up has to be carried out for every EIA project. When the competent authority decides about the project or plan approval, it also has to provide for an EIA follow-up section or program. This states in which way (what, when and how) the project will be evaluated. In contrast to preparing the EIS, not the proponent but the competent authority is responsible for investigating the environmental impacts during or after the activity is being implemented. However, the proponent is obliged to co-operate with the EIA follow-up – post-EIA monitoring and evaluation (see Box 1). When considered necessary, negative impacts on the environment must be restricted or undone as far as possible. The competent authority has to draw up a report of the monitoring and evaluation results, which is made public. This sequence of investigation, reporting and taking measures is gone through as long as considered necessary in a specific case (Arts, 1998; VROM, 1995). This formal procedure and requirements are rather succinct; the legislator left much freedom with the competent authorities (and proponents) for the implementation of the EIA follow-up requirement in practice.

**Box 1: Ministry of Transport = competent authority (DGP) = proponent (Rijkswaterstaat)**
The Ministry of Transport and especially its division *'Rijkswaterstaat'* – the Directorate General of Public Works and Water Management – is a major player in Dutch EIA practice. The Ministry carries out some 25 % of all EIAs and it has usually some 80 EIA projects for infrastructure (e.g. roads, railways, waterways, water management projects) in procedure at the same moment. For instance, Rijkswaterstaat is responsible for the majority of the road developments projects, most of them being extensions or reconstructions of existing roads rather than the construction of a new highway. In the combined route determination and EIA procedure, the Ministry of Transport is competent authority, proponent as well as developer.
To promote a careful process of checks and balances, there is a strict division of roles and responsibilities within the Ministry. The Directorate-General of Public Works and Water Management (Rijkswaterstaat) – which is responsible for construction, operation and maintenance of roads – acts as the *proponent* and developer in the procedure. The Directorate-General of Passenger Traffic (DGP) is responsible for general traffic and transport policies and acts as the *competent authority* in the procedure. In addition, the Ministry of Environment (VROM) is co-competent authority in the route determination and EIA procedure. Within the Ministry of Transport the Transportation/EIA-Centre functions as an internal consultant and expertise centre on EIA issues because of the importance of EIA to the Ministry's day-to-day operations.

In spite of these succinct though thorough legal provisions for EIA follow-up, *practice in the Netherlands* proves to be more cumbersome as only for a small proportion of the Dutch EIAs some follow-up has been carried out yet. By 1998, the EIA regulations were in force for more than a decade. Some 800 EIA projects/plans had been started, and more than 375 (draft) decisions had been taken. However, a follow-up study had started for only some 60 projects (for which an (draft) consent decision had been taken). For some 25 projects a follow-up report had been published, while a second report had been made public for 3 EIA activities (see Arts, 1998; EIA Commission 1997,1998). Since then this situation has remained similar. Twelve road projects are in the project stage that an EIA follow-up should be carried out however only for one project an EIA follow-up study has started.

In general, major reasons *why follow-up practice* is limited in the Netherlands relate to such issues as (Arts 1998): low policy priority (within authorities), lack of external pressure (by the public etc), lack of surveillance and formal sanctions (there is no penalty for not carrying out EIA follow-up and no body that checks this), and lack of insight in the benefits of EIA follow-up (usefulness and added value compared to the effort needed). In addition, deficiencies in EISs, inadequate techniques for follow-up, as well as financial, personnel and time constraints hamper follow-up in the Netherlands. More specifically, for the Ministry of Transport also the lack of guidance has been important. Dutch regulations for EIA follow-up are rather succinct – the legislator left much freedom with practice – thus the Ministry has to develop its own ways to implement EIA follow-up for road projects. As the Ministry is both competent authority and proponent for road projects (Box 1) also the division of roles and tasks within the Ministry is unclear for the EIA follow-up. The focus of Rijkswaterstaat (Directorate-General of Public Works, Ministry of Transport) is mainly the construction, operation and maintenance of roads and waterways. It considers follow-up as a means of improving the quality of its work by checking predictions in the real world – in a similar way as quality management and environmental management. The policy administrators (and decision-makers) of the Directorate General of Passenger Traffic (DGP) within the Ministry on the other hand – although acknowledging the possible benefits of follow-up for the quality of working processes – are very sensitive to the financial and political consequences of the results. What if impacts are much worse than predicted? When to take

action? Where to obtain additional funding for measures? There is a fear for opening 'Pandora's Box' (see Box 2). As a consequence they have not decided yet how to deal with EIA-follow up.

**Box 2: Opening Pandora's box?***
In the planning stage – preparation of the Route Plan and EIS – most of the resistance against planned activities comes forth form the so-called NIMBY effect ('Not In My BackYard'). People acknowledge the general problem – the importance of accessibility, safety and liveability related to the national road network – but oppose to solutions that directly intervene in their own living area – losing ownership of land or a house, experiencing noise, air or other nuisance. When making a decision, these local objections are taken into account by the competent authority. However, the final decision may be in favour of the national interest of infrastructure improvement and against the interest of one or more individual citizens. To protect the latter as much as possible, mitigation and compensation mea sures are usually proposed in the final consent decision.
In the stage of follow-up there seems to be something like a reversed NIMBY-effect. The outcome of follow-up studies mostly concerns local problems and local measures – e.g. higher noise levels than expected. Out of fear for creating a precedent, however, the competent authority may be very reluctant in taking small-scale measures. The Ministry of Transport is also responsible for the management of the national road network. Building one noise barrier is costly but perhaps acceptable. However, building similar barriers on equal locations all over the country costs billions of euros. As a consequence, there is an enormous 'cold water fever' in engaging follow-up; one might better not open Pandora's box.
* Source: after Van Lamoen & Arts (2002)

### 3. Guidelines for EIA follow-up of road projects

Driven by the fact that there is a legal requirement for EIA follow-up, the Ministry of Transport (both its divisions of DGP and Rijkswaterstaat in close cooperation) came up with a practical solution for implementation of the EMA requirements for EIA follow-up after a series of internal workshops. The discussion has led to a minimalist approach, frugal and efficient in Dutch terms – 'going Dutch'. This pragmatic approach contains a series of compact actions, embedded in existing procedures and programs and fed by information from sources already available. By using what is already available, costs and workload can be kept low. As screening is no issue in the Netherlands, due to the legal obligation for follow-up (see before), the approach focuses especially on scoping in order to achieve a cost-effective EIA follow-up.

**Table 1:** Framework for a stepwise approach of EIA follow-up of Roads (V&W, 2003)

| | Step | Content |
|---|---|---|
| *Preparation* | 1 Screening | Determine the need for EIA follow-up |
| | 2 Scoping | Determine follow-up issues |
| | 3 Operationalizing | Determine how to monitor and evaluate the issues |
| *Implementation* | 4 Monitoring | Gathering information, data collection |
| | 5 Analysing | Comparison of expected / predicted and real (measured) effects |
| | 6 Formulating measures / management actions | Description of potential remedial measures |
| | 7 Reporting | Preparation of EIA follow-up report and publication |
| *Conclusion* | 8 Decision-making | Decision-making about taking eventual mitigation measures |
| | 9 Implementation of remedial actions | Carrying out eventual (extra) mitigation measures |

Table 1 presents the framework for EIA follow-up developed by the Ministry and laid down in its guidelines for EIA follow-up of road projects (V&W, 2003). This series of steps closely links up with earlier frameworks for EIA follow-up both in the Netherlands (see e.g. VROM 1995, Arts 1998) and internationally (Au & Sanvicens, 1996; Sadler, 1996; Baker & Dobos, 2001; Baker, forthcoming). For instance, it comprises the four key elements of EIA follow-up as defined by Arts et al (2001; see also Morrison-Saunders & Arts, forthcoming): monitoring, evaluation, management and communication. Moreover, this way of planning projects, monitoring of environmental impacts when implementing the project and taking adjusting action when unwanted (and/or unexpected) deviations are found closely links up with classical concepts of quality control management (e.g. Environmental Management Systems like ISO 14,000): plan – do – check – act (Deming, 1986; Figure 1).

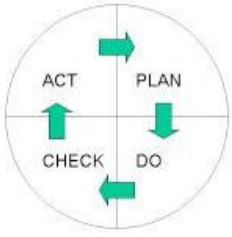



**Figure 1:** Deming's cycle of quality control (after Deming, 1986)

*Preparation of EIA follow-up program (steps 1-3)*
The steps of the framework presented in Table 1 closely link up with the existing division of roles and responsibilities and with the existing procedures of road planning and processes within the Ministry of Transport (see Figure 2). As a consequence, the steps of preparation of the EIA follow-up program (steps 1-3) are connected with the formal procedures for the preparation of the so-called combined Route Plan/EIS. For highway projects each EIS should contain a section or chapter about follow-up in which a first proposal is given about the EIA follow-up program for that specific project. Unfortunately, until now (i.e. before the guidelines were issued) these chapters were very brief and little tailored to the project. The same has been true for the final Route Decision that gives consent to a road project. Ideally spoken this should contain a complete monitoring and evaluation program, which describes scope, process and planning of the EIA follow-up for the specific project (i.e. steps 1-3). In practice the follow-up programs prepared have proven to be an insufficient basis for carrying out follow-up, which prevents an effective early start.

For scoping the EIA follow-up two categories of issues are distinguished in the guidelines (V&W, 2003): 'yes, unless' and 'no, unless' (Table 2). These categories set a 'rule of thumbs' for scoping for all road projects of the Ministry of Transport, but still leave room for tailoring to specific needs of a certain project. The first category ('yes, unless') comprises all aspects with a strong legal basis, either national or European: noise, air pollution and measures for mitigation or compensation of effects (especially on flora and fauna). Most of them are directly linked to traffic intensities. All these aspects should be included in the EIA follow-up program, unless they are clearly irrelevant to the project and/or the consent decision. The second category ('no, unless') contains all other aspects normally found in EISs for road development projects, such as nature, landscape, archaeology, cultural heritage, social impacts, soil and water issues. Effects for these aspects are mostly diminished by remedial measures such as mitigation or compensation. Thus, the evaluation of those measures themselves can act as an indicator for these aspects. In specific cases though, it can be relevant to incorporate them directly into the EIA follow-up program. In other cases, the initial monitoring and evaluation may be followed by an in-depth study on triggered aspects.

**Table 2** Scoping categories relevant for EIA follow-up of road projects (V&W, 2003)

| **'Yes, unless'** | **'No, unless'** |
|---|---|
| Noise | Landscape |
| Air pollution | Nature conservation (flora and fauna) |
| External safety | Social impacts (eg barrier effects, liveability) |
| Mitigation measures | Archaeology and cultural heritage |
| Compensation measures | Soil (including geomorphology and geology) |
| (Traffic) | Water (including surface and groundwater) |

*Implementation of the EIA follow-up study (steps 4-7)*
Up until this stage in the process, optimising the existing practice can form a solid base for a carefully carried out follow-up. For the next steps however, there was until recently no practical experience within the Ministry of Transport yet. The guidelines link the actual start of the follow-up study to the start of the realization of the project – i.e. the construction (Figure 2). This implicates that together with the decision to start construction – which provides funding and marks the beginning of the realization stage – the competent authority (i.e. DGP) should order the EIA follow-up program to be carried out (i.e. steps 4-7).

Within an EIA follow-up study monitoring (or more generally the collection of data) is one of the parts that may require a lot of labour and money. In order to reduce workload and costs, the guidelines for EIA follow-up suggest making as much use as possible of existing information. Providers of information can be the different divisions within the Ministry itself – e.g. information from their monitoring programs for maintenance, for policy evaluation and for traffic management – but in the Netherlands also numerous other sources are available. Many local or provincial authorities carry out monitoring programmes on different aspects. Next to this, there are data available from research institutes, private companies or non-governmental organizations (NGOs) such as nature conservation organizations. Needless to say, not all this information suits the purpose of the EIA follow-up for the specific road project. The focus, nature and level of detail therefore have to be assessed carefully in order to decide whether or not the information may be used.

*Conclusion of EIA follow-up study (steps 8-9)*
In order to be able to communicate the results and to take appropriate action there are build in at least two moments of reporting, one at the completion of the project (delivery and acceptance of the work) and one after a few years of use (steps 8-9). Regarding this second and (usually envisaged as) final follow-up study, a period of 1-3 years seems to be practical as the traffic figures will by then have stabilized and therefore it will be possible

to gain sufficient insight in the actual impacts of the use of the road. After this, follow-up activities should blend into the regular maintenance and management activities of Rijkswaterstaat.

A follow-up program – being related to a specific EIA and road development project – may become redundant as it becomes subsumed in other, regular operating systems – especially as projects are by definition finite (Van Lamoen & Arts 2002). EIA follow-up can be seen as a bridge between pre-decision EIA and the regular operation of an activity (i.e. monitoring for maintenance and management of the road network under Rijkswaterstaat's administration). Of course, all this is easier said than done. For example, under EMA the main objective of EIA follow-up can be seen as the evaluation of predicted impacts as result of a decision, whereas road-management and maintenance is about monitoring legal or policy-objectives. Therefore triggers for taking action may differ. In practice however, this problem may be solved by bearing in mind the principle of equal treatment; what is sauce for the goose is sauce for the gander. During the operational phase, in which the transition from follow-up into management takes place, remedial actions as a result of monitoring should not depend on the age or procedural phase the road track concerned.

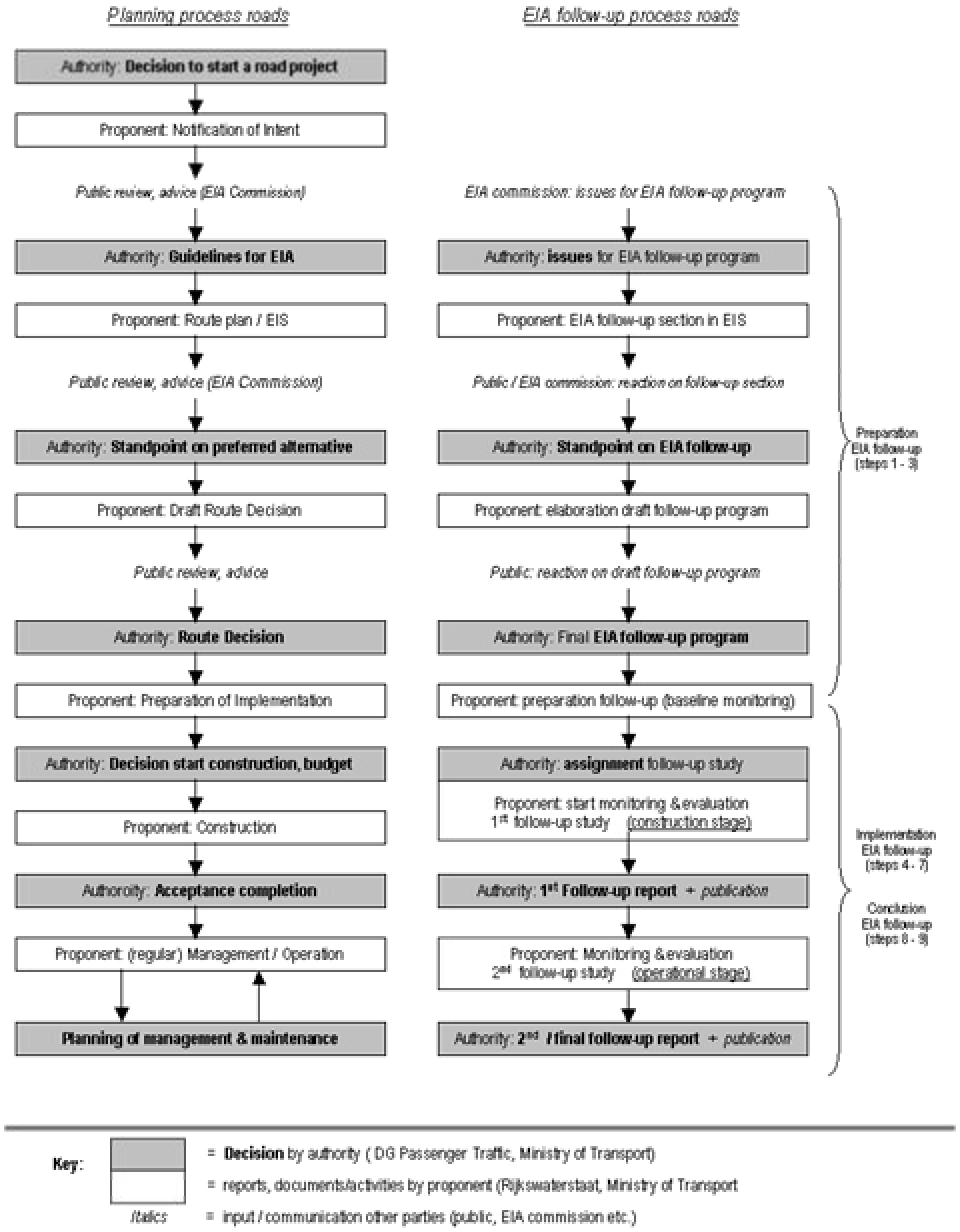



**Figure 2:** The process of road planning and the process of EIA follow-up for road projects (after V&W, 2003).

**4. The quick scan approach**

The preparation of the guidelines for EIA follow-up projects was triggered, inter alia (see also section2), by the fact that the Ministry of Transport had started or recently finished the construction of some 12 road projects that therefore should be subject an EIA follow-up soon in order to meet the formal requirements of EMA (TMC, 2003). However, in practice the Ministry of Transport had little experience with carrying out EIA follow-up studies for roads although the Ministry of Transport has gained some experience with EIA-follow-up for railway and water management projects (Arts 1998). However, follow-up may require a substantial amount of effort, money, time and capacity (both for the follow-up study itself and for remedial measures that might be necessary because of follow-up results). Therefore the Dutch Ministry of Transport decided to gain some experience with three pilots before deciding whether it will fully implement the guidelines for all of its road projects.

*Projects analysed*

In October 2003 the Ministry of Transport started a quick scan analysis to investigate what the consequences would be of implementing the EIA guidelines for EIA follow-up. In this quick scan the various divisions of the Ministry were involved: DGP functioning as competent authority; Rijkswaterstaat functioning as proponent; and the Transportation/EIA-Centre, which carried out, the quick scan analysis. In the quick scan three road projects that have been recently constructed are evaluated as a pilot (Figure 3):

1. A50 Highway Eindhoven–Oss in a densely populated semi-rural area with high nature values in the Province of North-Brabant province;
2. N34/37 Highway Hoogeveen–Emmen in a rural area in the Province of Drenthe; and.
3. A4 Benelux Corridor in the urban, highly industrialized port area of Rotterdam.


**Figure 3:** Map of national network of roads in the Netherlands indicating the three pilot projects.

The projects for the quick scan where chosen because of the following criteria (TMC, 2004):

- Regional distribution – the three projects in different parts of the Netherlands where chosen in such manner that EIA follow up experience could be shared throughout a major part of the Ministry's organization;
- Environmental diversity – projects located in both rural and urban environments so that different environmental topics could be emphasized in the quick scan;
- Different stages of the project – the projects are under construction or recently finished or in the exploitation stage. Thus both construction and exploitation stages could be investigated; and
- Availability of EIA follow-up programs – for all three projects a (draft) EIA follow-up programs had been prepared in earlier years allowing for a quick start without delays.

*Objective and scope*
The objective of the quick scan analysis was to provide information about the consequences of implementing the guidelines for EIA follow-up from both an environmental and organizational point of view (TMC, 2004). The analysis focused on such aspects as: approach, time, capacity needed and costs of the EIA follow study as well as the environmental impacts and the potential remedial measures. The latter were especially important to the policy and decision-making administrators within the Ministry (i.e. DGP). To answer this question it was necessary to assess the environmental impacts of the projects. Finally, the quick scan had also the objective to check whether the approach laid down in the Ministry's guidelines for EIA follow-up were logic and clear, in other words working well in practice or had to be adapted somehow. In fact the quick scan has been a 'learning by doing' exercise for the guidelines.

*Specific elements in the approach*
The quick scan followed the stepwise approach laid down in the Ministry's guidelines for EIA follow-up of road projects (V&W, 2003) discussed earlier. According to its pilot (quick scan) nature, however, the various steps presented in Table 1 were carried out much quicker. Proper in line with the actual "budget constraints" a quick scan approach was chosen with such guiding principles as: "mean and lean" and "quick and dirty". Starting points for the EIA-follow up quick scan were:

- use of existing information (no new research!);
- use of a strict scope and a focus on only the major environmental topics;
- use of expert judgement (field inspections observation instead of science-based research);
- focus on identifying trends instead of determination of "academic truth";
- a short time span (three months from start to end of the quick scan – in that sense this EIA follow-up approach was different from the process indicated in Figure 2);
- thinking through scenario's ("what if");
- workshops with practitioners of the various divisions within the Ministry of Transport: competent authority administrators (DGP) and project managers (i.e. proponents), environmental experts and regional experts of Rijkswaterstaat.


*'Ingredients of the Quick scan for EIA follow-up'*

*Process*
The quick scan analysis was mainly carried out during two workshops by practitioners involved in the three projects as competent authority or proponent and led by (independent) facilitators of the Transportation/EIA-Centre of the Ministry. The process followed in the quick scan EIA follow-up is depicted in Figure 4.

In the first workshop a brainstorm session was held on such aspects as: the relevant scope for the various projects, smart ways for operationalizing the follow-up issues, data collection (available monitoring databases, registrations because of permit conditions, state of the environment reports, other relevant studies). Although such an exercise had been done earlier for the preparation of the (draft) EIA follow-up programs. This earlier work had to be revised in light of the purposes of the quick scan analysis as well as the actual policy priorities. In fact, this workshop dealt with the preparation steps identified in the Ministry's guidelines for EIA follow-up of roads (steps 1-3, see Table 1).

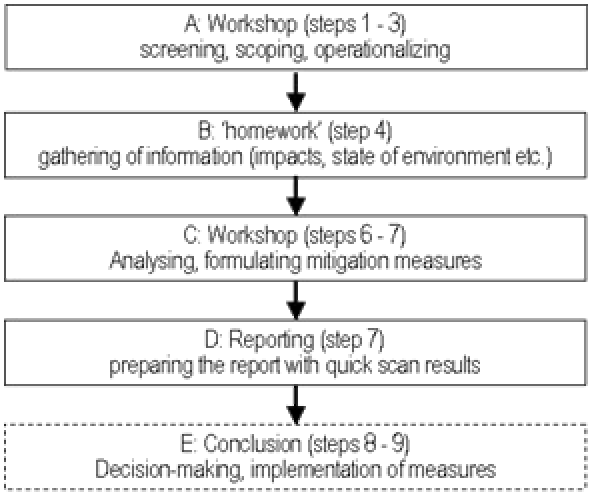



**Figure 4:** Process of quick scan EIA follow-up.

In the period between the two workshops the practitioners from Rijkswaterstaat (i.e. the proponents) gathered information and assessed the first results. For this purpose they were supported buy the Transportation/EIA-centre of the Ministry. These activities relate to the mainly steps 4 of Table 1.

During a second workshop with similar participants, the Rijkswaterstaat practitioners presented the preliminary findings of their projects – the final results of the quick scan follow-up for the three projects have been presented in the following sections. At the workshop the preliminary results were jointly discussed as well as the various remedial measures that were possible to mitigate the negative environmental impacts found (including their feasibility, costs etc). Thus, this workshop dealt with steps 5-6 indicated in Table 1.

Finally, the results have reported for all three projects in study report on the quick scan analysis that has been drafted by the Transportation/EIA-Centre in close cooperation with the practitioners involved of Rijkswaterstaat and DGP (TMC 2004). The Ministry (i.e. DGP) has not yet decided on the EIA follow-up results and whether these require extra mitigation measures for the three projects. Also the Ministry has still to decide on how to implement its guidelines for EIA follow-up of road projects.

The workshop approach made clear that it is very useful to do such a quick scan analysis together with proponent, competent authority and independent facilitators in close cooperation, because of such reasons as:

- the competent authority and proponent can explain to each other and defend their choices concerning the scope, resulting in a more robust and cost-effective EIA follow-up program and study;
- the proponent – who in practice has to carry out the follow-up study evaluation – is able to clarify the different possibilities and difficulties for the various methods for monitoring and impact assessment, collecting information and appraisal of results. The proponent also can provide knowledge about the local environment and the project specific context (social and political!); and
- the Transportation/EIA-centre as a knowledge broker and internal EIA specialist can provide information about methods for environmental assessment, monitoring and evaluation as well as "corporate" information of Rijkswaterstaat's road network which is useful for evaluation purposes. Especially the recently prepared report on the state of affairs and the performance of the national road network proved to be very valuable (RWS, 2003).

*'Quick scan for EIA follow-up process: parties together in a pressure cooker'*

*Results of the three cases*
The results of the three case studies are presented in the following sections that address the following aspects:

- main project characteristics – such as type of project (newly constructed or extending existing roads), length of infrastructure; characteristics of the area where road is located; planning stage; timing of construction; capital investment;
- major elements of the EIA follow-up program prepared in earlier planning stages;
- reasons for including the project in the quick scan analysis (step 1);
- scope and operationalization of the quick scan EIA follow-up (steps 2 –3);
- data collection and monitoring (step 4);
- appraisal of results (step 5);
- potential (extra) mitigation measures (step 6);
- feasibility and costs of taking extra (mitigating) measures (steps 7-9); and
- effort (costs) of quick scan versus full-blown EIA follow-up study.

*Note:* the steps refer to those indicated in Table 1.

## 5. Results quickscan EIA follow-up Highway A50 Eindhoven – Oss (The Netherlands)

*Main project characteristics*
The A50 highway between Eindhoven and Oss is located in northeastern part of the Province of North-Brabant, a semi-rural, densely populated region with Uden and Veghel as important towns. The region is characterized by its manufacturing industry as well as its agribusiness. Originally the area had an enclosed, small-scale landscape – characteristic of the higher sandy areas of the Netherlands – that is crossed by lowlands along the Dommel. Near this small river, the land use is considerably less intensive and can valuable nature areas be found. Before the road construction project transit traffic between Eindhoven and Oss cut across the centres of the towns in the area, causing considerable nuisance (noise, air pollution, barrier effects) and safety problems. In short, the traffic situation affects the living conditions of the people in the area. The various aims of the A50 project relate to improving the accessibility as well as the living conditions and environmental problems in the 35-km corridor between Eindhoven and Oss by taking transport and traffic measures (RWS North-Brabant 1991).

The Rout Plan/EIS was finished in November 1991 (RWS North-Brabant 1991) after some 20 years of discussion. In June 1993 the Minister of Transport decided to construct a new four-lane highway west of the towns of Son, Veghel, Uden and Nistelrode (see Figure 5). While preparing for construction, the mitigation and compensation measures were elaborated in a separate compensation plan in close cooperation with the regional authorities and regional and national nature conservation organizations. Only in 2000 Rijkswaterstaat started with the actual building activities. Most of the newly constructed road came into operation at the end of 2003 (a small part near Oss still under construction). The total budget for constructing the road was some 400 million Euro.

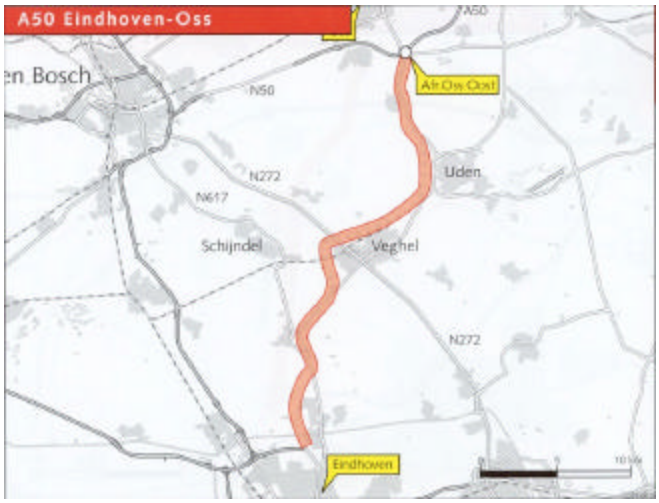



**Figure 5:** Highway A 50 between Eindhoven and Oss (V&W, 2001)

*Major elements of the EIA follow-up program prepared earlier*
The EIS included a follow-up section that has been the basis for a detailed scoping and elaboration of a follow-up program that commenced in 1995 (RWS North-Brabant, 1995). The primary objective and function of this EIA follow-up was to check whether the actual impacts were within the bounds of the original decision. An important additional objective was learning for future EIA projects. The scope of the EIA follow-up program concerned both the construction and operational phases. The first investigations commenced in 1996, one year before the actual road construction started and mainly involved an inventory of birds in a nature conservation areas and monitoring hydrological and soil conditions. These investigations were conducted to provide baseline data (a reference benchmark for EIA follow-up results) as well as to provide information additional to the EIS for detailed road design and construction purposes. The scope of the EIA follow-up program has been discussed during the project's implementation (RWS North-Brabant, 1998, 2003). For instance, in the operational phases, noise and traffic flows are to be monitored. For the selection of follow-up issues, various criteria have been used, such as degree of uncertainty of EIS predictions, possibilities for adjustment (technical, administrative and juridical), magnitude of the impact, the interests involved and the results of external consultation. Other principles used for making the EIA follow-up operational are measuring as close as possible to the disturbing source; selecting issues that are directly related with the A50 project (because of causality issues); and to keep the effort reasonable in terms of finances and staff resources (TMC, 2004). In the end, the scope of the final EIA follow-up program included (RWS North-Brabant, 2003): hydrology (groundwater flows and levels), air (concentration of pollutants near houses), noise (levels nears houses etc), nature (disturbance of birds breeding, measures to mitigate habitat fragmentation and compensation measures).

*Why a quick scan for this project? (step 1)*
The A50 road construction project is a relevant project for including in the quick scan analysis up since:

- the official EIA follow up program was already in progress. As a consequence it was possible link up with this for the quick scan and, for example, data collection could be done fast and efficient;
- the A50 project is situated in a semi-rural area which is quite densely populated but has nevertheless high nature values (especially birds breeding in the area). Therefore, major compensation measures were carried out for the project (nature development of some 280 hectares and 12.5 million Euro). The A50 project is one of the first examples of an infrastructure project in which nature compensation is applied on a large scale in the Netherlands (Cuperus & Graat, 2003).

*Scope and operationalization of the quick scan EIA follow-up (steps 2-3)*
During the first workshop it was decided that the next issues should be included into the scope for the quick scan analysis:

- hydrological aspects during construction phase and first stages of operation of the road (groundwater levels);
- nature: disturbance of birds breeding;
- nature: mitigation measures relating to habitat fragmentation (construction and use of various fauna passages);
- nature: compensation measures (realization of the compensation plans (amount of nature created (hectares) and quality (habitat indicators)).

As stated above, the scope of the formal EIA follow up program also includes such issues as: air and noise pollution. These issues have been excluded (they will be evaluated in the period 2007-2011), as the road has been in operation only partially since the summer of 2003. There are not yet reliable actual traffic data available that are needed for monitoring the aspects air and noise pollution.

*Data collection and monitoring (step 4)*
For the data collection (in between the two quick scan workshops) the following methods were used for assessment, monitoring and data collection:

- hydrological aspects: monitoring reports available because of formal EIA follow up program containing data from field measurements;
- nature, disturbance of birds breeding: (baseline) monitoring reports prepared because of formal EIA follow up program;
- nature, mitigation measures: field research of passage patterns of indicator species (e.g. roes);
- nature, compensation plans: desk research on progress of the implementation of the compensation plan (amount of farming land bought for conversion into nature, progress of conveyance of created nature area to nature conservation organizations, etc).

*Results (step 5)*
The quick scan revealed no major unexpected environmental impacts, most relevant findings are:

- the construction of the A50 highway caused no irreversible hydrological effects. The technical measures, that were taken to prevent damage to the environmental sensitive area, proved to be effective;
- due to heavy rains in the construction period there have been high water level problems and there has been some minor damage to vegetation. However, it is not clear whether this is directly related to the construction work or just because of the extreme weather conditions;
- the compensation and nature development measures have been carried out on schedule since some 260 hectares have been purchased (actually in the early stages of the project almost more nature was created than road was constructed). Progress and results of the nature development can be reviewed by the public via the internet [www.aanlega50.nl] (see Figure 6).


**Figure 6:** Website of the A50 Eindhoven – Oss project containing much information about for instance nature compensation measures (www.aanlega50.nl)

*Feasibility and costs of taking extra (mitigating) measures (steps 7-9)*
Because of these results of the quick scan EIA follow-up, only some minor additional mitigation measures should be implemented. Of course, one has to bear in mind that the impacts of traffic, and more generally the operation of the road, cannot yet be seen because of the stage of project implementation. A minor measure that might be carried out is to recover the vegetation that has been damaged as a consequence of the high water levels during the construction period. On basis of preliminary expert judgement these costs are estimated some 10,000 Euro.

*Effort (costs) of quick scan versus full-blown EIA follow-up*
On basis of the original EIA follow-up program and the experiences gained with the quick scan follow-up, the costs of a quick scan approach versus a full-blown EIA follow-up study can be compared:

- the quick scan follow-up has cost 4,000 Euro (mainly desk research);
- full EIA follow-up program prepared for the study 318,000 Euro.

**6. Results quick scan EIA follow up highway N34/A37 Hoogeveen – Emmen (The Netherlands)**

*Main project characteristics*
The N34/37 road in the Northern Province of Drenthe is located between the cities of Hoogeveen and Emmen is located in a rural area with moderate natural values. Since the 1970s the regional and local authorities as well as an number of regional companies have argued for doubling for some 40 km the capacity of the existing trunk road (creating a four-lane motorway) from Hoogeveen to the German border (N37) with aside road to Emmen (N34) (see Figure 7). Arguments put forward included: road safety, accessibility, stimulating regional economic growth and connecting the motorway networks of the Netherlands and Germany. The combined route determination/EIA procedure started in 1991 and two years later the Route Plan/EIS was published (RWS Drenthe, 1993). The Minster of Transport took the Route Decision that approved the alternative to reconstruct the existing road for doubling its capacity. In 1995 the construction started and most of the road construction has been finished and in operation. The construction of the last part between the town of Holsloot (South of Emmen) and the German border has been postponed because of budget restrictions. The total budget for constructing the road was some 150 million Euro.

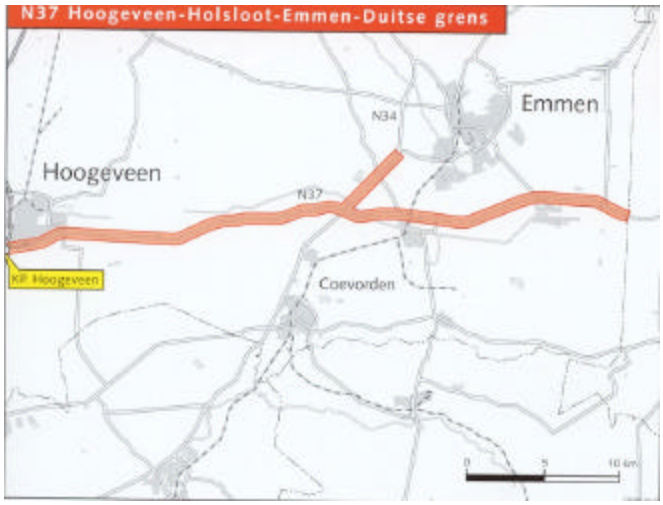



**Figure 7:** Highway N34/A37 Hoogeveen – Emmen (V&W, 2001)

*Major elements of the EIA follow-up program prepared earlier*
In the original Project Plan/EIS only little attention has been given to EIA follow-up – mainly that "later on, there shall be prepared an EIA follow-up program" (RWS Drenthe, 1993). The same is true for the Route Decision giving consent to the road extension project. In 1999 Rijkswaterstaat has prepared a draft EIA follow-up program for N34/37 project that determines the scope and level of detail of EIA follow-up. In this draft program the follow-up various issues were scoped rather strictly; it includes only one major follow-up issue – the effectiveness of the main fauna passages constructed to mitigate nature impacts (RWS Netherlands North, 1999).

*Why a quick scan for this project? (step 1)*
Highway N34/A37 Holsloot – Emmen is an interesting project for including in the quick scan analysis for EIA follow-up because of:

- the highway is constructed in three parts. The first two parts (A37 Hoogeveen – Holsloot and N34 Holsloot – Emmen) are already constructed and in use by traffic since 2002. The third part (Holsloot – German Border) has been postponed because of other priorities in budgets but is expected to be realized in near future. As a consequence, it is possible to include impact of operation (i.e. traffic) in the EIA follow-up quick scan;
- The highway is situated in a rural area in the northeast of the Netherlands. Fairly large compensation measures (nature development) are taken to remedy impacts on nature (90 hectares and 18 fauna passages).

*Scope and operationalization of the quick scan EIA follow-up (steps 2-3)*
During the first workshop it was decided that the quick scan analysis should include (scope):

- noise levels;
- air pollution;
- soil and water (including run-off water from the highway);

- nature: effectiveness of fauna passages constructed;
- nature: compensation measures (progress and quality);
- external safety.

As a consequence, the scope of the quick scan analysis for the N34/37 project is wider than the draft EIA follow-up program prepared in 1999 – which focused only on nature issues. Moreover, during the quick scan analysis also archaeological and social impacts were investigated (TMC, 2004).

*Data collection and monitoring (step 4)*
For the data collection (in between the two quick scan workshops) the following methods were used for assessment, monitoring and data collection:

- noise levels: generic reports on performance of the national road network (e.g. RWS, 2003) and project specific calculations based on actual traffic intensities;
- air pollution: generic reports on performance of the national road network;
- soil and water / run-off water: generic scientific research report on impacts of (run-off) pollution into soil and water (CIW, 2002);
- nature, effectiveness of fauna passages constructed: field research by practitioners (expert judgements)
- nature, compensation measures (progress and quality): desk research on progress implementation compensation plans;
- external safety: generic reports on performance of the national road network;

*Results (step 5)*
The quick scan EIA follow-up revealed some major unexpected environmental impacts. Most striking was that the actual traffic figures were 50% higher than the original predictions that were used in the EIS. On basis of that information it is concluded that:

- the legal standards for air pollution and external safety are not exceeded, but that
- the legal standards for noise pollution however will probably be exceeded in 2010 because of these new traffic figures (see Figure 8); in addition
- for the nature compensation the amount of hectares has been obtained. Also the conversion into nature area has started and vegetation is developing as expected;
- the nature mitigation measures (fauna passages) function well and are used by the animals.

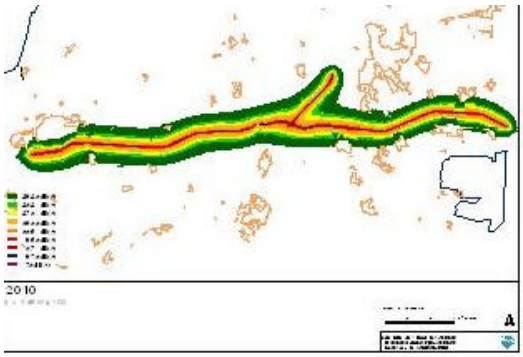



**Figure 8:** Noise levels N34/37 in 2010 on basis of actual traffic figures.

*Feasibility and costs of taking extra (mitigating) measures (steps 7-9)*
Because of the results of the quick scan analysis, extra measures to mitigate for the higher levels of noise should be considered. As a preliminary analysis suggests that additional measures (including the heightening of 2,3km of current noise barriers to remedy the noise problems) may involve a considerable amount of money – some 1.4 million Euro (almost 1% of the total investment for construction) – an in-depth analysis into the noise problems would be useful in order to get more grip on the issue.

*Effort (costs) of quick scan versus full-blown EIA follow-up*
On basis of the original EIA follow-up program and the experiences gained with the quick scan follow-up, the costs of a quick scan approach versus a full-blown EIA follow-up study can be compared:

- the quick scan follow-up has cost 10,000 Euro (mainly desk research);

- carry out a full EIA follow-up program with a similar scope of issues as the quick scan would involve some 200,000 Euro study costs. Note: the original draft EIA follow-up program only involves 25,000 Euro as it only focused on effectiveness of the main fauna passages (RWS Netherlands North, 1999).

**7. Results quick scan EIA follow-up Highway A4 Beneluxcorridor Rotterdam (The Netherlands)**

*Main project characteristics*
The Benelux Corridor project is a second cross-river connection over the 'Nieuwe Waterweg' in the densely populated and highly industrialized urban areas west of Rotterdam. Rotterdam urban area has over one million inhabitants, is the Netherlands' leading industrial area and has one of the world's largest ports, with a huge petro-chemical industry and a major transport sector (see Figure 9). The main reason for this newly constructed connection is that the road network in the region of Rotterdam is overloaded.

The road planning started in February 1982, before the Dutch EIA regulations were in force. It was the first project to follow the interim EIA procedure and in November 1985 the combined project plan/EIS was finished. The Route Decision was made June 1988 but in light of new national policies (the Second Transport Structure Plan; V&W, 1990), the construction of the Benelux tunnel was postponed and an additional study was prepared. In 1992, this additional study (RWS South-Holland, 1992) was finished and March 1993 the Cabinet decided that for the Benelux Corridor next to the existing motorway tunnel a new motorway tunnel should be constructed combined with separate new tunnels for the metro and bicyclists. In 1997, the construction of the project started and the new tunnel came into operation in 2002. The total budget for constructing the Benelux Corridor was some 350 million Euro.


**Figure 9: A4 Benelux Corridor in Rotterdam** (V&W, 2001)

*Major elements of the EIA follow up program prepared earlier*
The EIS for the A4 Benelux Corridor did not contain a section on EIA follow-up. However, the Route Decision contained a rather extensive section on follow-up. It not only described the environmental issues but also the specific methods for monitoring and evaluation that had to be used as well as a time schedule, a cost indication and a description of the potential additional mitigation measures. This EIA follow-up section focused on measuring various parameters before, during and after project construction. Only those aspects had been selected that were described in the EIS, that were quantifiable, and that could be influenced by measures. Issues that have been selected for evaluation concern, e.g., air quality, noise, soil and water quality (run-off), transport of dangerous goods, landscape, archaeological values, vegetation, fauna and nature areas, environmental impacts during construction – noise, vibrations and air pollution (Groeneveld, 1995). The original follow-up section also intended to monitor the project goals by monitoring traffic numbers. The follow-up section also stated that it would be elaborated into a detailed EIA follow-up program three months before construction starts. In 1998 Rijkswaterstaat prepared such an EIA follow-up program; the 1988 follow-up section needed to be elaborated and updated because of the changes that had occurred meanwhile with respect to the design and function of the project.

For the preparation of this rather extensive EIA follow-up program Rijkswaterstaat used the method laid down in the 'Guidance on EIA evaluation for road infrastructure' (V&W, 1996). In determining the scope of the follow-up, the

importance attached to an issue by various groups has been taken into account, as well as the effort needed for evaluating issues – i.e., costs, period, depth and complexity of monitoring and evaluation. In the end, the main issues covered in the EIA evaluation programme were similar as those mentioned in 1988 but some issues were excluded in this EIA follow-up program because of a more strict scoping exercise – e.g., non-local air pollution, dredging sludge, geomorphology, vegetation and fauna (RWS South-Holland 1998, Verberkt & Van de Putte, 1998).

*Why quick scan on highway A4?*
The A4 Benelux Corridor Rotterdam has been considered relevant for including in the quick scan analysis for several reasons:

- the highway was already opened in 2002 and is much used by traffic (impacts of operation).
- the highway is located in the densely populated and heavy industrialized urban area of Rotterdam that is confronted with serious environmental pollution (cumulative impacts);
- in the past an extensive EIA follow-up program was written, this made it possible to start the quick scan exercise quickly.

*Scope and operationalization of the quick scan EIA follow-up (steps 2-3)*
During the first workshop it was decided that the next issues should be included into the scope for the quick scan analysis of the Benelux Corridor project:

- air pollution;
- noise levels;
- external safety (transport of dangerous goods);
- soil and water (including run-off water from the highway);
- landscape and archaeology; and
- environmental impacts during construction (noise, vibrations, air etc.).

The quick scan analysis was restricted to only environmental issues; the project goals were not evaluated in the quick scan.

*Data collection and monitoring (step 4)*
The original EIA follow-up program (RWS South-Holland 1998) contained an extensive monitoring and registration program. As the time span available for the quick scan was very short, there has been chosen a much more pragmatic approach of using existing environmental reports and expert judgement. For the data collection (in between the two quick scan workshops) the following methods were used for assessment, monitoring and data collection:

- noise levels: generic reports on performance of the national road network and project specific calculations based on actual traffic intensities;
- air pollution: generic reports on performance of the national road network;
- soil and water / run-off water: generic scientific research report on impacts of (run-off) pollution into soil and water (CIW, 2002);
- external safety: generic reports on performance of the national road network;
- landscape and archaeology and impact during construction: these issues received much attention in the detailed designing and construction stages, the results and process of these stages will be documented by Rijkswaterstaat for future projects (learning);

*Results (step 5)*
The quick scan EIA follow-up revealed some major unexpected environmental impacts. Most striking was that the actual traffic figures were much higher than the original predictions that used in the EIS. Analysis (based on actual traffic rates) show that the expected traffic level for the year 2010 is already reached in 2004. On basis of that information it is concluded that:

- nevertheless, the legal standards for external safety are not exceeded; but
- the legal standards for noise and air pollution however will probably be exceeded in 2010 because of these new traffic figures; in addition
- the quick scan follow-up also revealed some problems with local water quality however it is not sure that this is (directly) related to the construction and operation of the Benelux Corridor.

*Feasibility and costs of taking extra (mitigating) measures (steps 7-9)*
Because of the results of the quick scan analysis, extra measures to mitigate for the higher levels of noise and air should be considered. As a preliminary analysis suggests that additional measures (including the heightening of 7 km of current noise barriers to remedy the noise problems) may involve a considerable amount of money –

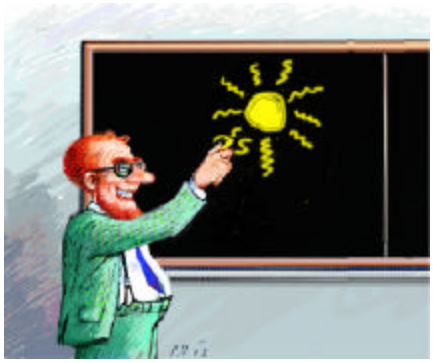
some 4.2 million Euro – an in-depth analysis into the noise problems is suggested in order to get more grip on this issue. Measures for slowing down maximum traffic speed in order to reduce air pollution would cost some 1.2 million Euro (investment) and some 0.8 million Euro (operational costs each year). The costs for solving problems with local water quality are uncertain. For both water and air pollution an in depth analysis is recommended to asses the real extent of the environmental problems and whether there is a direct (causal) relationship with the Benelux Corridor project.

*Effort (costs) of quick scan versus full-blown EIA follow-up*
On basis of the original EIA follow-up program and the experiences gained with the quick scan follow-up, the costs of a quick scan approach versus a full-blown EIA follow-up study can be compared:

- the quick scan follow-up has cost 6,000 Euro (mainly desk research);
- carry out a full EIA follow-up program (limited only to noise and air pollution and local water quality) would involve some 75,000 Euro study costs.

## 8. Lessons learned the quick scan approach on EIA follow up

From the discussion above, some lessons can be drawn about the EIA projects, the practicability of the Ministry's guidelines for EIA follow-up and the quick scan approach. These lessons relate to procedure, process and organization, and content related issues.



*'Lessons learned'*

*Procedural aspects*
With respect to procedural aspects of EIA follow-up, it can be concluded that the simple stepwise approach advocated in the guidelines for EIA follow-up of roads (V&W 2003) works well. During the quick scan analysis the steps were followed and this helped for a structured approach and enhanced transparency of the process for all involved (see Table 1 and Figure 4). It proves to be useful to distinguish clearly the preparation of follow-up (in fact, the preparation of the follow-up program; steps 1-3) from the actual implementation (i.e. the follow-up study; steps 4-7) and drawing conclusions (steps 8-9). However, it should be borne in mind that during EIA follow-up the process might be followed 'somewhat less neatly' – because of the need for some iterations – than the theoretical stepwise approach laid down in Table 1.

In addition, it is useful to the link up EIA follow-up preparation, implementation and decision-making with the existing (formal) procedures for road planning and the processes of operation and maintenance (see Figure 2). In fact, this has been the case in the three projects for the preparation of the EIA follow-up programs. However, with respect of the timing of the follow-up study-work and drawing conclusions from that (i.e. the quick scan analysis) there were major deviations from what is depicted in Figure 2. This is obvious as the approach laid down in the guidelines has been prepared later on. Moreover, on of the reasons for preparing the guidelines and carrying out the quick scan was that practice of EIA follow-up for road projects was lagging behind the formal requirements of EMA. In fact, the quick scan analysis might also be considered as an exercise to 'catch up with' follow-up regulations for the three road projects. As a consequence, the quick scan EIA follow-up for the Benelux Corridor and the N34/37 projects were focusing on the operational stage.

A clear division in tasks, roles and responsibilities for EIA follow-up proves to be important. Regarding this, it most useful to link up with the existing division of roles and responsibilities as has been done in the guidelines and during the quick scan. One of the reasons why the EIA follow-up requirement was not implemented well

within the Ministry was the unclear division of roles and responsibilities. Having stated this, however, it is also clear that it important to cooperate well. The workshop approach proved to be very useful because follow-up activities as scoping and choosing assessment methods are relevant to both proponent and competent authorities. The competent authority (responsible for the follow up in the Netherlands) was able to bring forward those environmental issues that are relevant for decision-making and the level of detail that is needed. The proponent (having much project and local knowledge) was able to bring forward those specific project issues and environmental factors that are relevant from regional point of view as well as the methodological (im)possibilities of assessing certain environmental factors. In addition it seems to be useful to have a (independent) facilitator for guiding the follow-up process – i.e. for well-structured process of workshops and answering specific (procedural) EIA follow-up related issues.

*Process and organizational related aspects*
The quick scan especially focused on the process and organizational related aspects. The workshop approach applied in the quick scan, in which proponents and competent authority were discussing the scope, the approach and the results of EIA follow-up, proved to be very useful for clarifying issues (about EIA follow-up requirements, procedure, objectives, etc.), prevention of confusion (e.g. methods, local/regional and policy issues), enhancing similar expectations (e.g. about scope, remedial measures, technical and political feasibility) and more in general mutual understanding (of each others position and role). In fact, the quick scan can be characterized as a process of joint fact-finding and mutual learning. However, an important limitation of the quick scan analysis as it has been carried out is that only parties within the Ministry were involved. Also the guidelines for EIA follow-up of road projects (but also the formal regulations of EMA) do not provide explicitly for involvement of external parties (e.g. people living in the area (the community), NGOs, (environmental) interest groups, businesses, research institutes etc.) during the stages of the EIA follow-up study and discussing the results. However, the workshop approach of the quick can easily be adapted to fill in this omission. It is valuable to make the EIA follow-up more transparent and open to other/external parties as checks and balances are built in this way, thereby preventing a distorted or too narrow scope as well as taking into account that the relevance of follow-up issues may vary among parties (see also Morrison-Saunders et al., 2001, 2003).

The guidance formulates a 'rule of thumb' to deal with the scoping of issues for he EIA follow-up of road projects (see Table 2). Although this rule of thumb proved to be a very useful starting point for discussion, the quick scan also revealed that specific issues might be relevant to include or /exclude because of specific project characteristics. For instance, for the A50 project especially nature and hydrological issues were considered relevant to include in the quick scan – because of the sensitive, high-valued nature in the area – while air and noise issues were not yet considered relevant as the road was not fully in operation yet.

As indicated already by its name, the quick scan approach to EIA follow-up requires little time, money and effort (around €4,000 – €10,000 for a quick scan analysis in stead of € 75,000 – €320,000 for carrying out a 'full-blown' EIA follow-up program of a road project). In only 3-4 months and to minor costs much insight has been created on the environmental performance of the three road projects, both within the proponent as the competent authority (the original EIA follow-up programs envisaged follow-up work for period more than ten years). Of course, the nature of the approach has also limitations that should be taken into account it is also somewhat 'quick but dirty' (see also below). Another interesting characteristic of the quick scan analysis was that it regarded three similar typed projects. The fact that practitioners confronted with similar issues discussed each other's projects enhanced the learning by experience nature of the workshops and enhanced the quality of the EIA follow-up analysis. Conducting EIA follow-up for a 'batch of similar projects' (similar type (roads), project stage etc.) was also cost-effective as, for instance, use has been made of generic reports on the environmental performance of the national road network (e.g. RWS, 2003) as well as the same experts/specialists for issues like noise, air, nature impacts of road projects.

**Box 3: 'Wallflower behaviour'**
The Ministry of Transport is relatively 'shy 'to monitor and evaluate road projects. One of the reasons seems to be that (possible) negative environmental impacts could be revealed which could imply severe financial burdens (because of the remedial measures necessary) – see Box 2. With this 'wallflower behaviour', the people involved tend to forget the positive (learning) effects and environmental benefits that can be revealed by monitoring and evaluating projects through EIA follow-up. One should not forget to mention also these positive outcomes of EIA follow-up. The quick scan (approach) revealed some interesting environmental benefits for the three projects:

- A50 highway: the quick scan indicated that the new-constructed highway reduced previously/still existent noise and safety (hazardous good transportation) problems in the towns where the old road was;
- A50 and N34/37 highways: the quick scan analysis made clear that the legally required compensating plans have been carried out on schedule and implemented well (respectively 280 and 90 hectares);
- N34/37: the quick scan made clear that faunapassages are used by animals and functioned well

It is important to stress also such positive effects because they can be used by decision-makers for future projects but also for communication with the community etc.

*Content related aspects*

On basis of the quick scan analysis it can be concluded that the three projects seem to have performed rather well, but that especially the traffic intensities proved to be higher than expected. This seems to be related to the quality measurement and predictions of traffic intensities. This seems to relate to the development of socio-economic and other external, autonomous factors (a very high growth of the economy, housing, working, mobility etc.), which differ also from expectations – i.e. the *dynamic context* in which EIA follow-up has to be done. These higher traffic intensities have especially consequences for such environmental issues as the levels of noise levels and air pollutants as well as safety (traffic figures are important since they are used as input for the calculations of these issues). Indeed, as the Benelux Corridor and N34/37 attract more traffic than predicted, the quick scan indicated that noise impacts (Benelux Corridor and N34/37) and air impacts (Benelux Corridor) will exceed the legal standards / predictions made in the EIS.

Here, the 'reversed NIMBY' phenomenon became clear in the quick scan analysis (see Box 2). As there are indications that the development of traffic intensities is generally higher than was expected in earlier years, this will probably also be the case for in other road projects. Because of the 'principle of equality', it is difficult for a national government body as the Ministry of Transport to decide to solve the noise and air pollution problems in one project and (for budgetary reasons) neglecting them in other projects which have equal severe environmental problems. Because of the huge potential costs (up to billions of Euros for the whole national road network), the decision-makers within the Ministry have been rather reserved to take additional mitigation measures for these individual projects. However, to overcome this issue it is suggested to link up with existing national monitoring and policy schemes for addressing noise and air impacts of the road network. The noise and air problems caused by roads have gained attention Ministries of Transport and Environment earlier. In fact this, this could be considered as an 'analyse local, act national' approach tot the reversed NIMBY-effect that can arise when doing EIA follow-up for infrastructure. The noise and air issues and their policy consequences overshadowed the positive outcomes of the quick scan analysis – for most other issues such as water, nature and landscape no important deviations were observed. As a result, the positive functions of EIA follow-up may seem to be neglected (see Box 3). There seems to be a 'cold water fever' to engage in EIA follow-up.

Much information already existed and could be used for the quick scan approach – project-specific monitoring studies carried out for the construction stages, generic reports on the performance national road network, general scientific report on specific issues (e.g. run-off), registrations because of permit conditions etc. On corporate level, the Ministry gathers much information (for different purposes) on yearly basis that also can be used for EIA follow-up purposes. For instance a recent report (RWS 2003) proved to be very useful for assessing the environmental performance of the three road projects for such issues as: air, noise, traffic safety and nature fragmentation. The quick scan analysis teaches that linking up with existing studies, monitoring and reporting can save much time, money and effort. An important warning however is that the level of detail was sufficient for the purposes of the quick scan analysis but may fall short in quality for a more in-depth follow-up study.

**Box 4: Full-scale monitoring & evaluation vs. quick scan approach for EIA follow-up**

Quick scan: major strengths

- an easy, fast and cheap way to scope on those issues that really matter;
- an early warning system so that environmental problems can be tackled before its too late.
- creates open communication through workshops between proponents and competent authority enabling mutual learning, discussing pragmatic solutions for difficult issues as: scope of issues, data-collection, choice of assessment method, analysing results and discussing potential additional measures;
- is short-term and makes people aware of the basic principles and objectives of EIA follow-up.

Quick scan: major weaknesses

- risk of not detecting issues and problems and underestimating problems. More thorough monitoring and evaluation is carried out on topics that seem to be problematic;
- although the quickscan approach offers some (solid) indications for environmental problems is to imprecise to form a basis for decision-making on expensive additional measures;
- the quickscan tends to focus on those environmental topics that are (politically) relevant at that very moment; it is (politically) short-term driven. In the Netherlands there is these days much attention on noise and air issues however soil or nature-related issues receive less attention.

Full-scale EIA follow-up: major strenghts

- less risk of not detecting potential problems as it is more comprehensive. This is especially relevant when there are major stakes (e.g. irreversible damage on high-valued environmental issues);
- more rigorous assessment of environmental impacts, enabling decision-makers to decide better on additional measures (especially relevant when those measures may involve major costs).
- more consistent scoping as it might be less influenced by short-term-driven political priorities. Less 'popular' environmental issues are investigated as well.

Full-scale EIA follow-up: major weaknesses

- the amount of effort (money, time and capacity) of full-scale monitoring and evaluation may easily become too high. This is particularly a problem if the follow-up reveals no or little environmental problems – in some cases there might be less costly ways for follow-up or to be more selective in scoping;
- time-lag: as full-scale monitoring and evaluation might imply intensive and thorough monitoring and research (especially when there is focused on measuring final impacts on flora, fauna or humans) it bears the risk of detecting environmental problems too late (when damage is already done) and being less useful for environmental management purposes.

*A two-track approach?*

The Dutch EIA regulations leave much freedom on how to carry out EIA follow-up in practice. There is room to choose between full-scale monitoring and evaluation (comprehensive and in-depth) or a quick scan approach for EIA follow-up. Of course both methods have their own advantages and disadvantages (see Box 4).

The quick scan can be considered as a useful, cost-effective instrument for EIA follow-up as it functions as:

- a tool for selective scoping of EIA follow-up issues;
- an early warning device for indicating the need for taking additional measures and/or for in-depth EIA follow-up.

It is crucial to tailor the scope of EIA follow-up well to the EIA project at hand. Follow-up can easily become complex and require much effort, as issues may have to be monitored over long time periods. EIA follow-up should not become a goal in itself. Instead, an *objective-led approach* to screening and scoping for follow-up is important. The quick scan analysis can be a useful instrument to achieve an adequate (useful and practicable) scope because of the process characteristics of the quick scan: close cooperation of the various parties involved, use of workshops attended by proponent and competent authority etc.

In addition, the quick scan approach focuses on those follow-up issues that are easily measured and can unambiguously be appraised against clear criteria and thus avoid problems with causality – as it can be very difficult to link unambiguously environmental changes to a project (because of complex measuring methods, synergism, accumulation etc.). The idea is to measure indicators related to emissions, immissions and performance of protective facilities instead of measuring final impacts on flora, fauna, landscape and humans. This may also enable an adequate and timely response to slow processes involving long-term impacts (e.g. groundwater pollution affecting 'downstream' habitats). This focus on source-related monitoring may be combined with for instance area-wide monitoring or registration of complaints in order to keep track of the changes in the environment; a sort of *'two-track approach' to monitoring*.

If the results of the quick scan reveal important environmental changes, this may warrant for an in-depth monitoring and evaluation of the specific issue in order to assess if the impacts are caused by the project (re-scoping). Such an approach – comparable to the 'mixed-scanning' approach in planning advocated by Etzioni (1967) – might be a sensible compromise to take into account the advantages and disadvantages of full-scale monitoring/evaluation and quick scans in EIA follow-up.

## References


- Arts, J. (1998), *EIA Follow-up – On the role of Ex Post Evaluation in Environmental Impact Assessment*, GeoPress, Groningen
- Arts, J., P. Caldwell and A. Morrison-Saunders (2001), 'EIA Follow-up: Good Practice and Future Directions: Findings from a workshop at the IAIA 2000 Conference', *Impact Assessment and Project Appraisal*, vol 19(3), pp175–185
- Au, E.W.K. and G.D.E. Sanvicens (1996), 'EIA Follow-up Monitoring and Management', in *EIA Process Strengthening*, Australian Environmental Protection Agency, Canberra
- Baker, J. and R. Dobos (2001), 'Environmental Assessment Follow-up: A Framework for Environment Canada (Draft)', paper presented at *IAIA'01 Impact Assessment in the Urban Context* conference, EIA Follow-up: Outcomes and Improvements workshop, 26 May–1 June 2001, Cartagena, Colombia
- Baker, J. (forthcoming) A practical Framework for EIA Follow-up, in: A. Morrison-Saunders and J. Arts (eds) *Assessment Impact: Handbook of EIA and SEA Follow-up*, Earthscan, London
- CIW, Commissie voor integral waterbeheer (2002), *Afstromend wegwater(Run -off water from roads)*, April 2002, The Hague.
- Cuperus, R. and A. Graat (2003), Compensating for ecological impacts of road development: eight years experience with Highway A50 (Eindhoven – Oss, Netherlands), *International Conference on habitat Fragmentation*, IENE.
- Deming, W.E. (1986), *Out of crisis*, Massachusetts Institute of Technology, MIT press, Cambridge, MA
- EIA Commission (1997), *Jaarverslag van de Commissie voor de milieu-effectrapportage over het jaar 1996 (Annual Report of the EIA Commission 1996)*, EIA series 56a/b, Utrecht.
- EIA Commission (1998), *Jaarverslag van de Commissie voor de milieu-effectrapportage over het jaar 1997 (Annual Report of the EIA Commission 1997)*, EIA series 57a/b, Utrecht.
- Etzioni, A. (1967), 'Mixed Scanning: A 'Third' Approach to Decision-making', reprinted in Faludi, A (ed) (1973) *A Reader in Planning Theory*, Pergamon Press, Oxford, pp217–229.
- Groeneveld, L. (1995), *M.e.r.-evaluatie, iets meer mag dat? Een onderzoek naar de mogelijkheden van m.e.r. -evaluatie bij wegenprojecten van Rijkswaterstaat (EIA follow-up, a bit more? A study into the potential of EIA follow-up in road projects)*, Rijkswaterstaat Directie Zuid-Holland / Greenwich University, Delft.
- Morrison-Saunders, A., J. Baker and J. Arts (2003), 'Lessons From Practice: Towards Successful Follow-Up', *Impact Assessment and Project Appraisal*, vol 21, pp43–56
- Morrison-Saunders, A, J. Arts, J. Baker and P. Caldwell (2001), 'Roles and Stakes in Environmental Impact Assessment Follow-up', *Impact Assessment and Project Appraisal*, vol 19, pp289–296
- Morrison-Saunders, A. and J. Arts (eds) (forthcoming), *Assessment Impact: Handbook of EIA and SEA Follow-up*, Earthscan, London
- RWS (Public Works Council, Headquarters) (2003), *Kwaliteit Fuctioneren Hoofdwegennet 200, (Performance of the National Road Network 2003)*, The Hague
- RWS Drenthe (Public Works Council Drenthe) (1993), *Tracénota en Milieu-effectrapport N37/34 (Route Plan / EIS N37/34)*, Assen.
- RWS Netherlands North (Public Works Council Netherlands North) (1999), *Concept evaluatieprogramma Rijksweg 37/34 (Draft EIA follow-up program national road 37/34)*, 15 March 1999, Leeuwarden.
- RWS North-Brabant (Public Works Council North-Brabant) (1991), *Tracénota en Milieu-effectrapport A50 Eindhoven-Oss/Ravenstein (Route Plan/EIS A50 Eindhoven-Oss/Ravenstein)*, November 1991, 's Hertogenbosch
- RWS North-Brabant (Public Works Council North-Brabant) (1995), *Evaluatie achteraf (art. 7.39 Wm) voor de A50 Eindhoven-Oss, Concept Projectvoorstel (Project Proposal for EIA Follow-up of the A50 Project)*, 's Hertogenbosch
- RWS North-Brabant (Public Works Council North-Brabant) (1998), *M.e.r.-evaluatie A50 Eindhoven-Oss, Projectplan (Project Plan EIA Follow-up A50)*, 's Hertogenbosch
- RWS North-Brabant (Public Works Council North-Brabant) (2003), *M.e.r.-evaluatieprogramma A50 Eindhoven-Oss, Projectplan (EIA Follow-up Program A50)*, prepared by M. van der Vlies, 's Hertogenbosch
- RWS South-Holland (Public Works Council South-Holland) (1992), *Beneluxcorridor, Select traject, Integrale studie (Benelux Corridor Integrated Study)*, January 1992, Rotterdam.
- RWS South-Holland (Public Works Council South-Holland) (1998), *Evaluatieprogramma milieu-effectrapportage Beneluxcorridor (EIA follow-up Program Benelux Corridor)*, March 1998, prepared by Arcadis Heidemij for Rijkswaterstaat Directie Zuid-Holland, Rotterdam.
- Sadler, B. (1996), *International Study of the Effectiveness of Environmental Assessment, Final Report, Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance*, Canadian Environmental Assessment Agency and the International Association for Impact Assessment, Minister of Supply and Services, Hull, Quebec
- TMC, Transportation/EIA Centre (2003), *Interne memo inventarisatie reparatieslag m.e.r. evaluatie wegenprojecten (Internal memo inventory of road projects subject to EIA follow-up)*, july 2003, draftedby R. Nijsten, Ministry of Transport, Public Works & Water Management, Delft
- TMC, Transportation/EIA Centre (2004), *Quick scan m.e.r. evaluatie (Quick scan EIA follow-up)*, drafted by R. Nijsten and J. Arts, Ministry of Transport, Public Works & Water Management, Delft
- Van Lamoen, F. and J. Arts (2002), "EIA Follow-up for Road Projects: What Do We Want and Need to Know?", Paper presented at IA follow-up workshop, 22nd Annual Meeting of the International Association for Impact Assessment, 15-21 June The Hague, published on CD ROM: *IA Follow-up Workshop* , Published by Environment Canada, Hull, Quebec
- Verberkt, M. and B. van de Putte (1998), Evaluatieprogramma Benelux -corridor (EIA follow-up Benelux Corridor), *KenMERken*, April 1998, Vol.5/no.2, pp. 12-15.
- VROM, Ministry of Housing, Spatial Planning & Environment (1995), *Handleiding evaluatie m.e.r. afvalstortplaatsen (Guidance on EIA follow-up for waste disposal projects)*, EIA series 51, drafted by J. Arts (Rijksuniversiteit Groningen), Den Haag
- VROM, Ministry of Housing, Spatial Planning & Environment (1996), *Environmental Management Act*, English Text of the Environmental Management Act dated 1 August 1996, The Hague
- V&W, Ministry of Transport, Public Works & Water Management (1990), *Structuurschema Verkeer en Vervoer II, Deel d regeringsbeslissing (Second Transport Structure Plan, Part d government decision )*, The Hague
- V&W, Ministry of Transport, Public Works & Water Management (1996), *Handreiking evaluatie m.e.r. weginfrastructuur (Guidance on EIA follow-up for Road Infrastructure Projects)*, drafted by Th.F. Klink and P.H.M. Eijssen (DHV), Rijkswaterstaat DWW series, Delft
- V&W, Ministry of Transport, Public Works & Water Management (2001), *MIT-Projectenboek 2001 (Long-range Program on Infrastructure and Transport 2001, overview of projects)*, SDU Publishers, The Hague
- V&W, Ministry of Transport, Public Works & Water Management (2003), *Werkwijzer Evaluatie milieueffecten hoofdwegenprojecten, Leidraad voor de evaluatie achteraf bij m.e.r. (Guidelines for EIA follow-up of road projects)*, drafted by J. Arts and F. van Lamoen (Transportation/EIA Centre), Delft.