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# Transparency in Road Planning Documents: A Case Study of Two Swedish Projects

Kajsa Hylmö, Erik Skärbäck

**Public opinion, expressed through written comments, developed very differently throughout the planning phases of two road projects in southern Sweden. Each project's Prefeasibility Study, Feasibility Study, and Environmental Impact Report (EIR) were studied to analyze the changes between five evaluation phases: background and inventory of base data, replenishment with additional information, consequence analysis, conflict analysis, and priorities. For one of the road projects, rich and early descriptions of impact estimates, along with appraisals of the effects on the landscape, paved the way for more effective dialogue. Better disclosure of its reports' established facts and evaluations might explain the more solid acceptance for that road project. The other project did not clearly show the reasoning behind its priorities, which may explain the many public and agency comments on the EIR; consequently, people constructed and submitted their own viewpoints regarding impact. This article discusses how transparent documentation and presentation of priorities ultimately can contribute to the success of similar projects.**

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## Background

**P**ublic comment surrounding two studied road projects in the county of Skåne, southern Sweden, showed differences both in opinion and in characteristics. The project roads, Väg 17 and E22, are shown in Figure 1. Comparable in many ways, the two projects are described in a recent article by the first author:

In both cases, bypasses around . . . towns were planned. . . . [The projects] were both in the same part of the country; the processes ran almost simultaneously; they affected similar categories of people (e.g., farmers and commuters); and both projects concerned areas with strong environmental preservation and protection values. . . . A fair amount of traffic passes through all [three of] the towns involved. (Hylmö, 2005)

Hylmö's article shows that the E22 project caused substantially more frustration to the general public than did the Väg 17 project. Public comment, expressed through letters submitted to the Swedish Road Administration (SRA), developed very differently throughout the planning phases of the two projects. In project E22, the feasibility phase and its subsequent exhibition (similar to United States hearings) yielded a large amount of frustration that exploded into an outburst of opinionated letters. During the E22 prefeasibility phase, more than double the number of letters came in as went out to the public. During the feasibility phase, those numbers quadrupled from the prefeasibility phase, only to double again during the exhibition phase of the Feasibility Report and the Environmental Impact Report (EIR). Hylmö (2005) seeks explanations as to how the project managers' actions and extent of communication with the general public elicit the different citizen reactions.

In the over 300 submissions to the SRA regarding E22 and Väg 17, nearly 4,000 comments were present. Each argument could be classified as belonging to one of the following main categories of complaint:

- Concern for the physical environment
- Lack of communication
- Lack of analysis

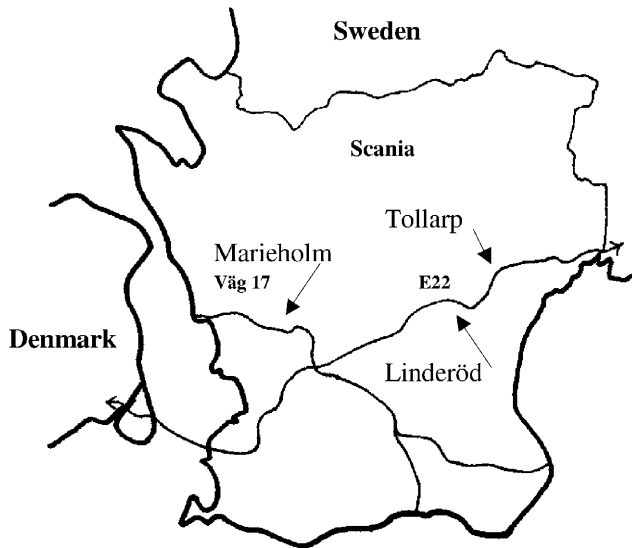
An unexpectedly large proportion of the letters contained complaints regarding insufficient communication and analysis (Hylmö, 2005). There was therefore reason to analyze the written reports; our new research question asked whether

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**Figure 1.** Map of southern Sweden showing the location of two road projects, Väg 17 and E22.

there were pedagogic differences that could explain the differences in the citizens' reactions. We believe that a thorough understanding of the reports is dependent upon pedagogic transparency. According to McClintock, Ison, and Armson (2003), "Transparency is achieved through professional practice that through reflection, creates awareness, responsibility and ethics."

#### A Swedish Procedure Model for EIRs

Transparency was a focus in an environmental impact study of a stationary connection between Sweden and Denmark. A landscape analysis, *Öresundsforbindelser Landskapsanalys* (Statens Naturvårdsverk, 1978), was done to investigate the impact of a possible bridge over the Öresund Sound between Denmark and Sweden. The project specifically pointed to the importance of providing an overview of demands on natural resources as well as the opportunities, consequences, and conflicts involved in the planning proposals. This was one of the first environmental impact assessments for a big project in Sweden. The information was organized so that evaluations and professional decisions were based on base data and analysis, following the work chain "inventory → analysis → synthesis" (Skärbäck, 1981).

#### The Public Comment Process in Sweden

In Sweden, the Prefeasibility Study, the Feasibility Study, and the EIR are required to be publicly exhibited in an

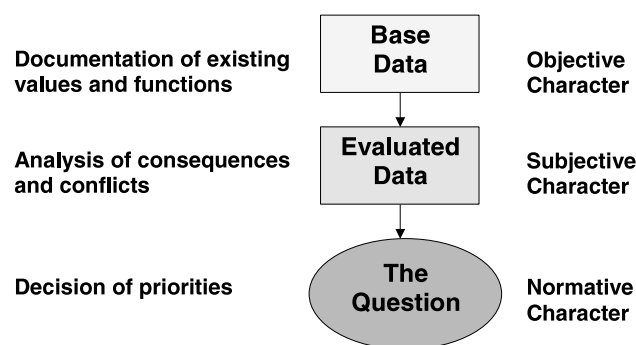
easily accessible place. The exhibit must last for "a sufficient amount of time," usually about a month. Special public hearings, called *Samråd*, are held during the time of the exhibition; officials, stakeholders, and the public are invited to these meetings. People with opinions are invited to send their submissions within a specified time, usually within one month after the end of the exhibition. A *Samråd* is arranged for all interested parties, to ensure that the Road Administration hears all points of view during the entire planning process, including the work on the EIR. The result of the *Samråd* must be documented, and all comments must be considered and commented upon.

Most environmental professionals rely on oral communication skills (Coppola, 1997), but written and illustrated documentation has the advantage of reaching many persons at an appropriate time and place. A main intent of the documentation is to provide to the general public information on the environment and the project evaluations; in other words, the reports have a pedagogic function, and this was the target of our study. Through studying transparency, we wished to analyze implementation and see if the documentation had any bearing on the differences between the two road projects.

#### Objectivity versus Subjectivity

The Öresund Sound project discussed the methodology from the perspective of objectivity versus subjectivity (Skärbäck, 1981). The process was made transparent, i.e., easily accessible, through a presentation of the different phases: base data collection, evaluation, and the answering of relevant questions (see Figure 2). Base data are generally of a rather objective character, whereas evaluations are more subjective; however, base data always have a subjective ingredient, even though some indicators (such as noise and air quality) can be measured, because the measurement method and classifications are chosen with some subjectivity.

Throughout the process, subjective evaluations have to be made. Subjective evaluations lend uncertainty to the degree of truth of the work performed. This uncertainty can be handled in a number of ways. Both the investigator and the message recipients need to be made aware of the base data and evaluations that lie behind priority decisions and answers to the project questions. In addition, it is essential that the reader be able to follow each evaluation from base data to conclusion; (s)he should be able to make personal evaluations and also make and test alternative evaluations (Skärbäck, 1981).



**Figure 2.** The transparent work chain for the Öresund Sound Bridge Project between Sweden and Denmark, showing progression from inventory through analysis to synthesis. Base data, evaluated data, and final conclusions (as answers to the main planning questions) are characterized by different degrees of subjectivity. (Source: modified from a figure in Skärback, 1981.)

It is our belief that if the reader is able to follow the work process from base data through evaluations to preferred alternatives, he or she will be more likely to accept the project and its planning process. A statement describing an alternative proposal's effects on natural and cultural resources does not always provide sufficient data for the decision process. The effects, through further evaluation of data, should be expressed as consequences affecting the concerned parties, by disseminating information to the various parties and providing a basis for political discussion. This results in a description of the compatibility/conflicts of the various alternatives for different land use interests.

### EIR Work Procedures in Various Countries

The work process from base data to synthesis is also interpreted in German guidelines for EIRs (Depenbrock and Schiefler, 1991). These guidelines are a regulatory prescription set by the German Department of Trade and Industry and by the Department of Justice (Bundesministerium für Wirtschaft und der Justiz); they regulate work in the planning and building process, including the work of the EIR.

The following five steps are part of the work procedure:

1. Establishment of scope of work (3% of total time allowed).
2. Inventory and evaluation of area to be examined, usability of the resources, and sensitivity of resources; compilation of material and field inspections (30%).

3. Conflict analysis and alternatives; evaluation of the project's impact on nature and landscape, as well as the exchange between the different influences; evaluation of the needs for deeper examinations of alternatives; check of legal conflicts (20%).
4. Rough draft of the EIR; work through basic solutions at important points; description of important solutions and consideration of the various paragraphs in the law regarding avoidance and compensation for negative consequences to nature and landscape; evaluation of natural changes that would take place without the new project; description of negative impacts for which compensation cannot be made; comparative evaluations of different alternatives; consultation with proprietor (40%).
5. Final EIR, in prescribed format with text and maps (7%).

Over thirty years ago, James A. Roberts, a pioneer of Environmental Impact Assessment (EIA) in the United States (as well as in Sweden) presented a work procedure with comparable phases (Roberts, 1973). He maintained this same EIA procedure for twenty years of practice (Roberts, 1991). Roberts' approach consists of the following steps:

1. *Inventory*: Description of environmental setting, Public and private goals, and Regional situation.
2. *Futures*: Assumed futures and Future needs.
3. *Alternatives to proposed actions*: Technical, Site, Design, Engineering, Construction, Operation, Energy, and "No project."
4. *Analysis of Fit*: Environmental impacts and Mitigation measures.
5. *Recommended Plan*: Description of project, Significant environmental effects, Short-term vs. long-term effects, Cumulative effects, Irreversible effects, and Growth-inducing effects.
6. *Action!*: Conditions for approval, Management recommendations, and Monitoring programs. (Roberts, 1991)

The above-mentioned work processes also largely correspond to the guidelines for EIRs in Sweden (Vägverket, 2002). From the guidelines in the US, Germany, and Sweden, we generalize a Procedure Model with a work chain (Table 1). The model consists of five encompassing phases showing a logical progression from *inventory* through *analysis* to *synthesis*. The phases show an increasing degree of evaluation from one phase to the next. The focus of the present study is on how the documents from the two projects differed concerning transparency of evaluations from base data to conclusions.

**Table 1.** The Procedure Model shows a clear progression through different levels of evaluation, from inventory through analysis to synthesis

1	Reasons for a new road; account for existing documented material of relevance for the project
2	As work progresses, replenish with additional information
3	Estimate and appraise influence, effects, and environmental consequences caused by the project in various points, sections, and areas
4	Estimate and appraise conflicts regarding other land use interests, checking for possible measures/actions
5	Suggest priorities of various alternatives

## Methods

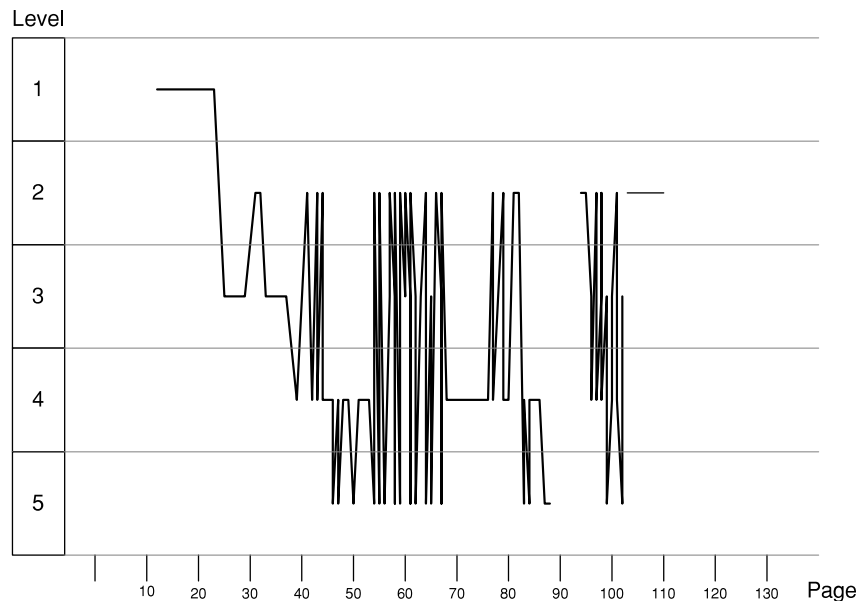
A criterion for an open description of how conclusions have been derived is that the work chain from base data to evaluations and priorities should be transparent. We studied this transparency by using the Procedure Model (Table 1) for analysis of all five reports from the two road projects, Väg 17 (Vägverket Region Skåne, 1997, 2001a, 2002) and E22 (Vägverket Region Skåne, 1998, 2001b). The reports of the Prefeasibility Study, the Feasibility Study, and the EIR were analyzed. The processing of the information through the five different phases in the Procedure Model demonstrates

the documents' derived conclusions. The five phases in the work process correspond to five levels of evaluation, from rather objective to fairly subjective (also, refer back to Figure 2). We observed how the investigators made and presented evaluations from basic information and how the reports showed the changes, relationships, and movement between inventory, analysis, and synthesis. We read each of the documents and registered the level of evaluation for each page. The results were plotted into diagrams to show the interplay among the five evaluation levels corresponding to background and base data, replenishment with additional information, consequence analysis, conflict analysis, and priorities of alternatives (Figures 3 through 7).

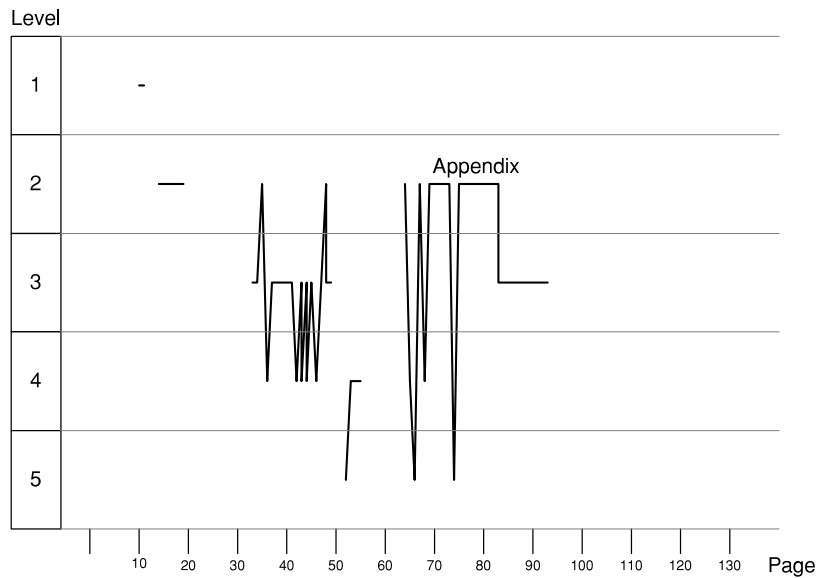
## Results

### Comparison of the EIR Documents

The EIRs are analyzed in Figure 3 for Väg 17 and in Figure 4 for E22. Figure 3 shows that the Väg 17 report starts on Level 1, supplying base information. It goes on to analysis and evaluations of the base data, shown in the figure by frequent interplay between Levels 2, 3, 4, and 5. Figure 4 shows that the E22 report has minor interplay between the different levels. Note that the interruptions in the curve



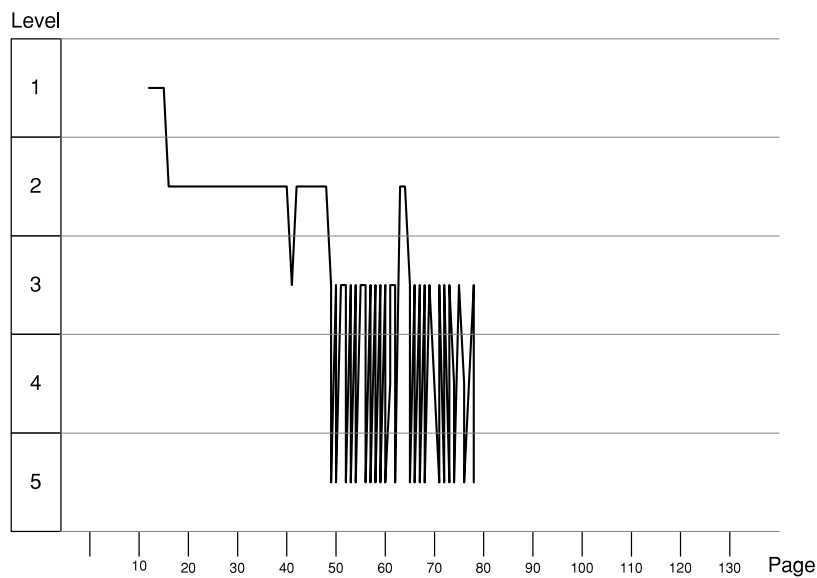
**Figure 3.** The Environmental Impact Report of Sweden's Väg 17 project: interplay between the different levels. The figure shows where each level of investigation occurs in the report. Levels 1–5 correspond to the levels of Table 1. Note that a page does not have to be fully covered by its corresponding level; for example, in Level 5, priorities are usually summarized in one or two sentences.



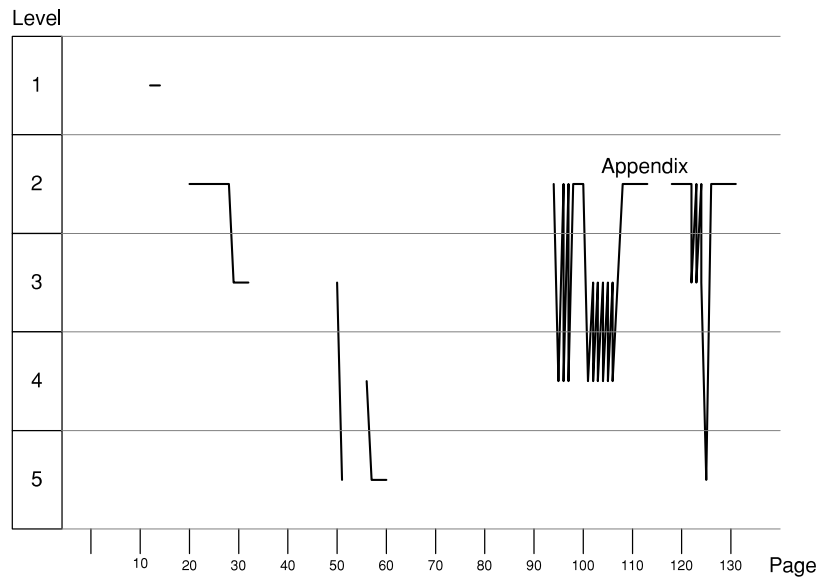
**Figure 4.** The Environmental Impact Report (EIR) of Sweden’s E22 project: interplay between the different levels. The figure shows where each level of investigation occurs in the report. Levels 1–5 correspond to the levels of Table 1. Where interruptions occur in the “EIR curve,” the document contains feasibility elements. Note that a page does not have to be fully covered by its corresponding level; for example, in Level 5, priorities are usually summarized in one or two sentences.

line for E22 (Figure 4) occur because E22 uses one and the same document for both the feasibility documentation and the EIR (the EIR covers pages 10–11, 14–19, 33–49, 52–55, and 64–93).

The major difference between the two reports is that the Väg 17 report more frequently discusses consequence analysis, conflict analysis, and priorities (Levels 3–5). The report for E22 focuses on Levels 2–4 and contains few discussions at Level 5.



**Figure 5.** The Feasibility Study of Sweden’s Väg 17 project: interplay between the different levels. The figure shows where each level of investigation occurs in the report. Levels 1–5 correspond to the levels of Table 1. Please note that a page does not have to be fully covered by its corresponding level; for example, in Level 5, priorities are usually summarized in one or two sentences.

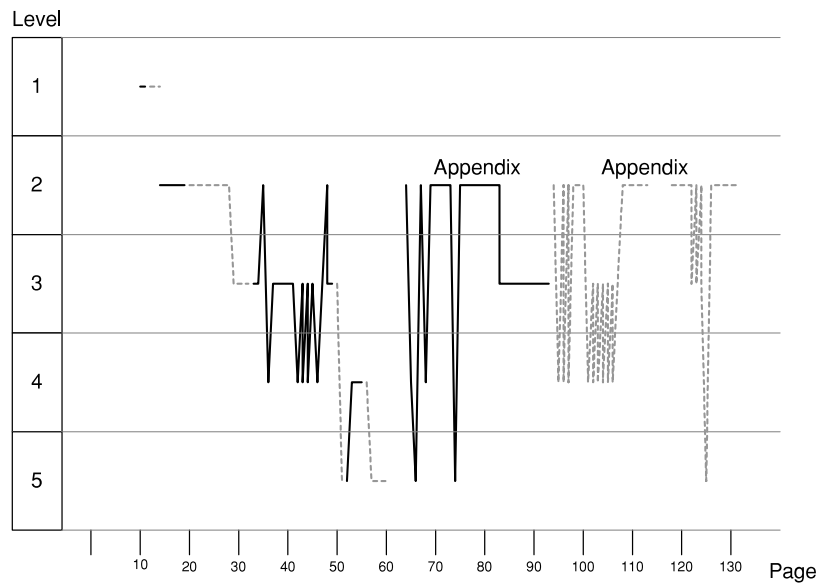


**Figure 6.** The Feasibility Study of Sweden’s E22 project: interplay between the different levels. The figure shows where each level of investigation occurs in the report. Levels 1–5 correspond to the levels of Table 1. Where interruptions occur in the “feasibility curve,” the document contains EIR elements. Please note that a page does not have to be fully covered by its corresponding level; for example, in Level 5, priorities are usually summarized in one or two sentences.

### Comparison of the Feasibility Reports

A similar analysis was performed for the Feasibility Reports. Figure 5 shows that the Väg 17 report starts at Lev-

els 1 and 2, supplying base information. It goes on to analysis and evaluation of the base data, shown in the figure by the interplay between levels 3, 4, and 5. Figure 6 demonstrates how the E22 report also started by showing



**Figure 7.** The Feasibility Study (dotted line) and the EIR (continuous line) of Sweden’s E22 project. The figure shows where each level of investigation occurs in the report. Levels 1–5 correspond to the levels of Table 1. Please note that a page does not have to be fully covered by its corresponding level; for example, in Level 5, priorities are usually summarized in one or two sentences.

base data at Level 1, but it presented very little information corresponding with Level 5.

### Overall Comparison

The investigators in the Väg 17 project went much farther in their evaluations, comparisons, and conclusions (between Levels 3, 4, and 5) than did the authors of the E22 report. This is illustrated by the Väg 17 curve’s frequent shifts between the various levels and the more frequent appearance of Level 5. Because of the lack of evaluations, comparisons, and conclusions, the E22 stakeholders might have felt more uncertainty regarding the impending road expansion; this may be an explanation for the many project comments and concerns received.

Because the E22 authors presented their Feasibility Report and EIR in one joint document, we merged Figures 4 and 6 into a single graph (Figure 7). The merged curve underscores that both the Feasibility Report and the EIR alternate between Levels 2 and 4, but rarely reach Level 5.

The report for E22 is more difficult to follow. In addition to having the EIR intertwined with the feasibility document, it contains some priorities relatively early and also presents valuable basic information with evaluations of effects at the end. Most of the evaluations in the combined document are distributed into ten different attachments encompassing almost half of the report. These attachments include geology, natural environment, cultural environment, landscape views, natural resources, noise and air pollution, evaluation of natural values, landscape history, and archaeology. A possible explanation as to why the qualified expert investigations were added successively as appendices is that they were missing from the beginning

and were added later in the project after remarks were received from others, such as the County Administrative Board.

### Comparison of the Prefeasibility Reports

The Prefeasibility Reports encompass very few pages, which makes it difficult to put the data into a diagram. Instead, they have been compared in a table (Table 2) corresponding to the Procedure Model in Table 1. The comparison shows that the Prefeasibility Report for E22 devotes only two pages to estimation and appraisal of impacts, whereas Väg 17 devotes three times as much space (6 pages) to the same purpose.

### Discussion

On the whole, the project E22’s EIR contains at least as much encompassing text on environmental issues as does the Väg 17 report. E22 has qualified specialists’ investigations on landscape history, environmental values, and archaeology. They are assembled in appendices containing no fewer than seven thematic studies and three in-depth studies. Each investigation has been completed under its own special guideline and methodology; some studies provide a synthesis of priorities of alternatives, and some were published without any mention of priorities at all. An overall picture regarding discussions of alternatives, evaluations, and priorities is lacking because of inadequate editing of the report. A comprehensive summary with pros and cons of each suggested road alternative was not developed. The immediate impression is a lack of coordination, emphasized by the fact that the expert investigations are placed at the end of the EIR and not early on or

**Table 2.** Analysis of Prefeasibility Reports for Sweden’s Väg 17 and E22 projects: extent of various levels discussing environmental issues

Phase of Work	Väg 17: Pages Where Levels Occur	E22: Pages Where Levels Occur
1 Reasons for a new road; account for existing documented material of relevance for the project	30–37, including 1 map (7 pages)	10–15 and 2 maps (8 pages)
2 As work progresses, replenish with additional information		
3 Estimate and appraise influence, effects, and environmental consequences caused by the project in various points, sections, and areas	41–42, 48, 50–52 (6 pages)	19, 20 (2 pages)
4 Estimate and appraise conflicts regarding other land use interests, checking for possible measures/actions		
5 Suggest priorities of various alternatives		



integrated into the report text. The material should have been arranged differently to aid understanding of the project, and the report should have concluded with alternative evaluations and priorities.

Every project relates to the environment in a very complex way, and every process represents an investigation of broad and diverse expertise (National Research Council, 1989). Road projects involve many facets of the environment and thus involve a multitude of expert findings. We believe it is essential that facts, analysis, and evaluations be presented in an instructive way. If a reader of a document understands not only the basic investigation but also *why* the experts and project managers came to a certain conclusion, that person will feel much more confident and comfortable with the report and its contents than a person who can only read the report's conclusion.

Richer descriptions of estimates and appraisals already present in the Prefeasibility Study most likely paved the way for the more effective dialogue surrounding Väg 17 (Hylmö, 2005). Better connection between established facts and evaluations in the EIR and the Feasibility Report is also likely to be a reason for the more solid acceptance of the Väg 17 project. It appears that readers exhibit greater confidence and trust if causality between base data, analysis, and synthesis is presented in the EIR and in the exhibition. Readers want to be able to follow the reasoning and make their own conclusions and evaluations (Palm and Windahl, 1989); this enables them to see whether they agree with the investigators or not. It is also likely that people want the opportunity to follow up and check whether their submissions of arguments have been considered. McClintock, Ison, and Armson (2003) have already confirmed these findings by showing that demand for transparency in environmental planning is growing.

Overall, the E22 project received more letters than Väg 17, but during the prefeasibility phase the number of claims of missing or misrepresented information was greater for Väg 17 (Hylmö, 2005). Looking back at Table 2, Level 3 (consequences), one can see that the Väg 17 report provided more early information on which to comment (six pages in Väg 17, as opposed to the two pages in E22); consequently more letters were generated at that stage. The claims were fewer in the subsequent steps. Hylmö (2005) also showed a decrease in comments relative to missing or misunderstood facts throughout the subsequent phases of Väg 17. It appears that the low number of concerns during the E22 prefeasibility phase is due to the almost non-existent consequence analysis at Level 3. Over time, however, E22 ex-

perienced an ever-increasing number of public comments and concerns. This confirms the importance of an early start to a transparent environmental impact assessment.

New developments in the landscape demand time to reach public acceptance; it takes time for potentially affected persons to grow accustomed to the thought of a new addition (Naturvårdsverket, 2003) and to fully understand the environmental consequences. An early start to the environmental discussion extends the time at the beginning of the project process, giving people a better opportunity to accustom themselves to the project; this reduces the risk of delays at the project's end.

By comparing correspondence with private parties, including incoming and outgoing letters, during the Prefeasibility Study, Feasibility Study, and EIR, Hylmö (2005) showed that for Väg 17 outgoing mail exceeded incoming mail during the Prefeasibility Study. The project manager of Väg 17 explicitly asked people to supply relevant information. That the incoming information from the public was taken into account is evident upon analysis of the outcome of the Feasibility Report and the EIR; this is shown by the project manager's frequent returns to Level 2 (see Figures 3 and 5). Palm and Windahl (1989) call this way of handling communication "reward." The reward in this case is that people are given an inner feeling of satisfaction by perceiving their viewpoints are treated as valid. Replenishment with deeper information through public participation builds confidence and trust in the project. Enserink and Monnikhof (2002) define the procedure as a criterion of long-term quality, which leads to speed and smoothness at the implementation of the priorities.

Even with the replenishment of deeper information, it is important to keep the report consistently coherent. The E22 project used appendices to a greater extent to display a variety of information. This resulted in a lack of coordination of evaluations from base data through conclusions, and this does not present a holistic perspective, which makes the Feasibility Report and EIR hard to follow. The most important factors promoting credibility relate to the accuracy and the legitimacy of the process, as perceived by the recipients (National Research Council, 1989). In our project, the recipients are the stakeholders. Presenting all facts (i.e., the basis for conclusions) in a transparent way improves the recipients' perception of the document.

The road planning process will run more smoothly if the project is already well planned in the early prefeasibility phase. This is particularly true when time and effort are

spent early on to enhance information from local residents (Naturvårdsverket, 2003). Moreover, the most effective risk messages are those that consciously address the audience's perspectives and concerns (National Research Council, 1989).

## Conclusion

We have demonstrated how different conclusions have been presented, from basic facts, through analysis and synthesis, to final conclusions and priorities, and how this might explain disturbances in the public acceptance process. We have also demonstrated that a lack of information in the final step of synthesis, i.e., conclusions and priorities, seems to be a reason for dissatisfaction among the public. Logic derivation is important to prevent massive opposition from the public and other stakeholders. Thus, in the environmental planning process, early transparency and the allowance of time for people to grow accustomed to the project facilitates a smoother project later on.

Our study shows the importance of transparency in communication. It is of significant importance that the EIR and all other documents lead the reader through the investigation by showing the evaluations and priorities for different alternatives of the proposed action. The document must present data and evaluations in a way easily accessible to the reader. The reader should be able to follow the investigation step by step and to draw his or her own conclusions, agreeing or not agreeing with the investigator. The documents are vital because they are a basis upon which the public's opinion and participation rests.

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