

VISUAL STUDY METHOD FOR NOISE BARRIERS

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VISUAL STUDY METHOD FOR NOISE BARRIERS

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1. INTRODUCTION

For several years, the Service de l'environnement of the ministère des Transports du Québec has used a **specific visual study method** for evaluating proposed noise barriers along existing roads and autoroutes.

The first version of this method dates back to 1987. It is derived from a more general method called Méthode d'analyse visuelle pour l'intégration des infrastructures de transport, that can be translate as the *Visual Analysis Method for the Integration of Transport Infrastructures*. Since 1987, the specific visual study method for evaluating proposed noise barriers has undergone significant changes to make it more practical, while certain additional tools have been developed.

Underlying this approach are objectives of "verifiability", i.e. the possibility of verifying in detail the study conducted, and of "reproducibility", i.e. the hability to produce again a visual study of a project with the same method and obtaining a result similar to that of the first visual study of the project, without prior knowledge of the result of the first study.

2. THE GENERAL PROCESS

Normally, the visual study begins when, on the basis of the acoustic assessment, a tentative sound barrier solution is proposed. From this point on, the noise study that is almost achieve and the visual study are done concurrently. These two studies may or may not be published in the same report called Étude de pollution sonore, that can be translate as *Study of Sound Pollution*.

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The complete process of producing a report is divided into four phases: the preparatory phase, the survey phase, the elaboration phase and the publishing phase. The visual study per se is carried out in the first three phases and may or may not be included in the more comprehensive report.

This report is prepared at the beginning of the process of studying a proposed noise barrier. After the report, there are other stages, including a public consultation, the preparation of plans and specifications, and the construction of the noise barrier. Hence, the visual study is only part of an overall process.

3. TENTATIVE NOISE BARRIER SOLUTION

As indicated previously, the visual study begins after a tentative noise barrier solution has been found. A tentative noise barrier solution consists of a brief definition of the project, specifying the type or types of barriers proposed, i.e. a berm, a combination of a berm and a wall, or a wall alone, according to the site. These types may also be modified as needed through the addition of retaining walls or devices. The tentative noise barrier solution also specifies the location and minimum dimensions.

4. THE PREPARATORY PHASE

The preparatory phase of the visual study is quite conventional. It includes the tasks involved in roughly demarcating a study zone, in searching for cartographic or other documents concerning the zone and in examining the tentative noise barrier solution.

A number of simple rules must be followed in roughly demarcating a study zone. The boundary is drawn 300 metres, or about 1000 feet, from each of the two ends of the planned barrier, along the centreline of the barrier, and 300 metres from and parallel to the two boundaries of the right-of-way of the road or autoroute that is the source of the noise.

5. THE SURVEY PHASE

The survey phase is relatively simple. It consists basically of an on-site inventory of the relevant visual elements and other characteristics. However, it has a number of special features, including a structured photographic survey for the purpose of preparing a distinct photographic file, and the measurement of various elements for the production of a special type of visual simulation.

The visual elements and other characteristics surveyed are:

- relief
- hydrography
- vegetation
- land use and the age of the land use
- types of views
- orientation elements
- viewers present
- preferences of viewers

The photographic survey is made considering two categories of views, i.e. so-called "representative" and "strategic" views. Representative views are those showing an ordinary landscape within the study zone. Strategic views are those taken at sites accessible to the greatest number of people because they are public and because of their position, and sites where the arrangement of landscape elements is particularly noteworthy. Here, it is a strategic view because it is a view of downtown Montreal.

The photographic survey is also made with consideration for the various groups of viewers present in the study zone, that is, viewers along the road who are stationary and reside there and user-viewers, who are mobile and are riding on the autoroute or road along which the proposed noise barrier is to be built.

6. THE ELABORATION PHASE

The elaboration phase is at the heart of the process and includes numerous tasks. This phase is divided roughly into two parts, a general examination followed by a more detailed examination.

6.1 The General Examination

The preparation of a photographic file consists in numbering the photographs, locating them on a plan, sorting them by viewer group, and mounting them on cardboard.

After the photographic file is prepared, the next task is the visual simulation of a noise barrier location. This involves making illustrations representing, on a realistic background, the spatial scope of the planned noise barrier as defined in the tentative solution.

An unusual colour, for example purple, is used. It symbolizes here the presence of a planned object in the landscape, but it in no way represents its final appearance, which is not known at this stage in the preparation of the project.

The next task consists in demarcating the visual access zone of the proposed noise barrier, since the study zone considered for the following tasks is practically reduced to the visual access zone included inside the rough study zone. An inventory plan of the visual elements and characteristics and a plan of the landscape units are then produced.

The planned noise barrier is also divided into visually significant sections. These normally correspond to sequences that a user goes through when travelling or, in other words, to sections of the barrier, each of which produces a homogeneous effect within the landscape where it is found; this depends heavily on the local visual elements and characteristics.

6.2 The detailed examination

From this point on, the visual study enters a phase in which the analysis becomes more detailed. Specific tables for the various subsequent tasks are then used.

An inventory of the relevant visual fields by visually significant section of the barrier is then made. This task is carried out for roadside viewers as well as users. The visual field is then described in some detail, taking into consideration the orientation of the visual field and the median position of the group of viewers considered. These tables are decisive, for they contain the **reference data** used in assessing the intensity of the visual impact of the planned noise barrier. They particularly make it possible to check the study carried out or to reproduce the findings if necessary.

The same principle applies to the assessment of the intensity of the visual impact of the planned noise barrier by visually significant section, for which various tables are used. The assessment per se is based on the approach used in the general reference method already cited.

The assessment takes three factors into account: the visibility of the planned noise barrier, the change in the visual interest of the landscape and the change in the cultural value of this landscape. Each of these factors is analysed using a number of parameters indicative of the prevailing visual phenomena.

After this, a noise barrier insertion measure plan is established.

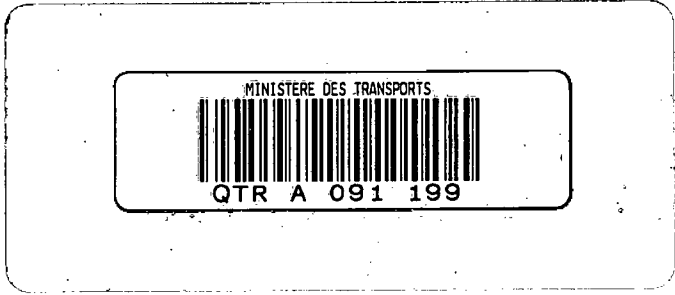
An insertion measure is a measure for inserting the noise barrier in the landscape in order to mitigate, relieve or offset a visual impact deemed to be of average or high intensity. If required, it can also be a measure to beautify the proposed noise barrier.

A table of insertion measures is also prepared and cost estimates are made for the measures.

7. CONCLUSION

At this stage, the visual study per se is, for all practical purposes, complete. In theory, the next working phase is the publication of a noise pollution study report integrating acoustic and visual studies. However, the process presented illustrates a theoretical situation. In reality, the process for a specific file may differ in order to take into consideration events proper to the case at hand. For example, the visual study may begin at the same time as the acoustic study on the basis of a hypothetical noise barrier used for the visual study. The acoustic and visual studies can also be published independently.

In this type of report, with regard to the visual study, rather wide use is made of figures, illustrations and tables. Emphasis is placed on the transmission of data rather than on a text. The text of the report is then basically used to stress the highlights.



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