



Protecting the environment and motorway Evaluating the norms and standards for fauna passages

Key facts

When construction or maintenance is carried out on the motorway network, environmental concerns play an ever increasing role. Environmental norms and standards are a topic which frequently recurs in politics because they are looked upon as a factor which makes projects more costly. At occasions such as parliamentary committee meetings or inaugurations of national motorway sections, one frequently hears about standards which are too lavish, too high or too costly.

The Swiss Federal Audit Office (SFAO) conducted an analysis of these norms and standards focussing on fauna passages, an area which it considered to be exemplary. The width of bridges built since 1992 varies between 15 and 200 metres, depending upon the option chosen. The SFAO was interested in the content of these norms and standards and examined the procedure in its entirety, from the design stage to implementation in projects. In addition to documentary analysis and in-depth discussions, 14 structures were examined. It was possible to determine the costs. A comparison with the practices observed in Austria and France completes the evaluation.

“Norms” and “standards”, too difficult to understand terms

Despite the fact that a definition of the term “standard” exists, it is subject to numerous interpretations. The SFAO noted that the very notion of a standard, which is so often brought up in the language used by experts, covers a wide variety of meanings and refers to a large quantity of texts and documents published by federal agencies. The differences compared to the standards drawn up by associations for standardization are not always clear. The notions of norms and standards are not the same in the various European countries, experts have a different understanding and perception of them. The rules and regulations are followed by a multitude of aids, directives, circulars, guides and recommendations laid down by the Federal Roads Office (FEDRO) and the Federal Office for the Environment (FOEN) and are considered in this study to be standards. Added to this are the norms and technical directives drawn up by the associations for standardization.

Obligatory nature often unspecified

Concerning fauna passages, a directive exists published in 2001 by the Federal Department of the Environment, Transport, Energy and Communications (DETEC). Except for this directive, it is not always easy to gain an overall view of the norms and standards which must be observed in order to construct and maintain fauna passages. If one seeks to integrate all wildlife, other directives, norms, aids and manuals must be taken into account. Whereas the majority of the aids come from FOEN, other documents, most notably on planning and maintenance, were drawn up by FEDRO. Confronted with this multitude of norms, directives and aids, project managers have trouble following them all. There exists no up-to-date index of all the norms and standards to be taken into account when tackling a project. This is all the more serious when priorities need to be set; it is diffi-

cult to tell which rules are constraining and which norms and standards are merely to be considered as recommendations.

The situation is clearer in France and Austria. In France, two technical guides contain the information relating to all fauna and are meant to be conceived as recommendations. In Austria, only the Association for Standardization draws up directives, the constraining or unconstrained nature of which is then recognised by the Department of Transport. In these two countries, task sharing is more simple because the Department of Transport holds core domains and has environmental experts at its disposal. This facilitates access to more standardised information and ensures the transfer of knowledge to the project managers.

A welcome directive on fauna passages ...

DETEC's 2001 directive on wildlife passages definitely means progress compared to the previous situation where the rules were not clear and therefore subject to interpretation. The directive is acknowledged by those in charge of planning and implementation of the fauna passages and provides useful information without involving additional costs. In particular, it defines standard widths, e.g. 50 metres for a wildlife overpass. The fact that this comes from the department and that it is binding on both federal agencies represents an advantage. This model could be extended to other environmental fields, the goal being that the two federal agencies adopt rules, i.e. standards which are applicable to both of them. It is worth mentioning that the DETEC's directive on fauna passages is better known than the corresponding norms from the professional associations.

... which comes late and does not integrate all aspects

A series of conflicts had to occur before DETEC forced the federal agencies to draw up common standards. The publishing of the first manuals for civil engineers, the launching of research and the publication of technical norms took an entire ten years. In addition, given the time required to carry out the projects, the directive was applied only since 2006.

The directive mainly concerns corridors which are important on a nationwide level, big wildlife and the refurbishment of the national road network. To get an overall view, it is necessary to refer to other norms and standards. The necessity of both professional association norms and federal agency standards with very similar contents may also be questioned. The fact that the norms on wildlife passages do not give any indication on the recommended type of construction (civil engineering) is even more astonishing.

Wildlife corridors identified but no complete inventory of wildlife passages built

The SFAO was surprised as to how difficult it was to obtain full information concerning the number of wildlife passages already built, of those still to be built, and the costs involved. Information is particularly patchy concerning passages for small animals. Whereas the wildlife corridors have been identified, there is no complete inventory of existing wildlife passages, nor an inventory of possible passages for non-specified constructions for fauna.

....risk of maintenance of the passages not being carried out

In the absence of a full inventory of the possible passages for fauna, there is a significant risk of passage maintenance not being carried out, which creates a problem to the extent that a passage which is not maintained may become useless in that it is not used by fauna. For example, a tube placed under a motorway to allow small animals to cross has a tendency to become blocked regu-

larly by dead leaves piling up, amongst other things, which makes it impossible for fauna to use it. This should be compared to Austria where any passage which is likely to be used by wildlife is entered in an inventory, and monitoring of the passages is integrated into the half-yearly check of civil-engineering structures.

...and costs which are difficult to determine

The SFAO estimates that 33 big fauna passages were built between 1986 and 2006 on main roads. Amongst these, 3 constructions alone cost CHF 192 million and 22 constructions amounted to CHF 79 million. These costs were probably underestimated, as it has not been possible to determine precisely what they refer to.

Overpasses less costly than road underpasses

On the basis of the constructions examined by the SFAO, an overpass costs an average of CHF 1'750 per square metre, as compared to an average of CHF 4'250 per square metre for a road underpass. Since overpasses only need to support their own weight and a layer of earth, they are less expensive than road underpasses.

The SFAO has shown that the average cost of a passage for large and medium-sized animals is around CHF 3.5 million whereas the Federal Roads Office (FEDRO) applies CHF 5 million as a basis for each construction. 35 constructions remain to be built and one should assume an investment of approximately CHF 125 million over the next 15 years (instead of CHF 175 million according to FEDRO estimates).

The SFAO notes that there has been a clear improvement in the construction projects drawn up during the drafting and after the implementation of the directive, as compared to those projects planned before. The directive has had a positive effect on current projects and several projects have been modified. The width of constructions for fauna no longer exceeds 50 metres. An interesting observation is that there has been no more conflict on the width and siting of the fauna passages after 2001.

Model structures, maintenance and durability of the passages: persistent problems

Model structures and specific design (due to forest fringes, hedges and barriers, etc.) linking the fauna passage to the ecological surroundings are an essential element in ensuring access for fauna to a passage and thus its usefulness. They can provide access to a passage becoming impeded. However, they often pose a problem because they are found outside the area of main roads and are situated on private land. The model structures themselves are not costly. Maintenance of the fauna passages can not be counted on, the situation varying greatly from canton to canton.

The durability of the fauna passages and their long-term viability appears problematic because of the pressure exerted by urbanisation. One will ponder the construction of costly passages, knowing that the corridor will probably be closed down in the wake of the construction of new industrial zones or residential areas, particularly in areas already heavily urbanised. Hence the importance of linking the problem of fauna corridors to that of town and country planning.

Too many or too little standards? More than the multiplicity of standards, the lack of coordination between the two federal agencies has been the cause of disputes and additional costs

Too many or too little standards? Apart from the fact that even the definition and significance of the term “standard” differs depending upon the agency, the DETEC directive on fauna passage clearly shows that the previously prevalent absence of common rules brought about additional expenditure and conflict. Above all it is the absence of coordination between the two federal agencies which has generated conflict and difficulties in achieving a solution. Norms and standards recognised by the two agencies thus would allow for a joint solution to be found. The example of the fauna passages shows that the absence of standards up to 2001 caused numerous situations of conflict, in particular between the two federal agencies. Above all it is the overabundance of standards, the fact that they come from two different agencies, and the uncertainty as to the degree of their constraining character, that create the problem. According to the received information from both offices the SFAO notes that the cooperation has improved considerably since then.

Potential for improvement and recommendations

The SFAO assumes that the changes resulting from the implementation of the new financial equalisation provide a unique opportunity to improve the situation and to clarify the distribution of the scope of activities between the different players. The SFAO puts forward a number of recommendations amongst which are the standardization of environmental standards, the creation of a full and updated inventory of norms and standards to be applied and the clarification of their status (constraining / non-constraining). These recommendations are applicable also to other environmental areas. Furthermore, it should be examined to what degree the DETEC directive on fauna passages may act as a model for drawing-up or revising other standards. The recommendations are a supplement to a recent study commissioned by the Federal Office for the Environment on the simplification and standardization of aids to enforcement issued by said agency.

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