SWOV Factsheet

Use of road safety knowledge by policy makers

Summary
Scientific knowledge is used extensively in developing road safety policy, yet, at the same time, specific factors could improve the use of this knowledge even further. For instance, the requirements of knowledge users with respect to timing, presentation, relevance, usefulness and implementability of knowledge are important, as well as wishes with regard to the quality of the research and the trust that policy makers have in this quality. Other important factors are institutional factors. Road safety *policy* is often determined on various government levels, focuses on the integration of road safety in other policy domains and deals with political arguments. Road safety *knowledge*, on the other hand, more often focuses on the national level, on road safety as an separate subject and on technocratic arguments. In order to improve the use of scientific knowledge in road safety policy, more knowledge should be developed specifically for regional and local governments. Moreover, researchers and policy makers could attempt to take their differences in argumentation and interests more fully into account.

Background and content
Both researchers and policy makers work towards the improvement of road safety. As such, each has its own role and rationality. Research shows, for instance, that policy makers do not always use all available knowledge (for illustrations, see *Chapter 1* in Bax, 2011). At the same time, policy makers and politicians often have good reasons for not having their policy be guided by objective scientific knowledge alone. They balance this knowledge against various other interests that they have been entrusted with. This fact sheet will provide a theoretical support of the difference between science and practice, show the factors that influence the use of scientific knowledge by policy makers and indicate options suggested in the literature to advance the use of road safety knowledge.

How is knowledge and knowledge use defined?
In international literature, the term knowledge is often left unspecified. Edelenbos (2000) distinguishes the following types of knowledge:
- data: loose, unstructured data;
- information: data ordered in a way that makes sense;
- knowledge: information consolidated in a person or organisation;
- wisdom: a combination of knowledge, experience and intuition.

More information is provided about the definition of the term 'knowledge use'. In the literature about *knowledge utilization,* 'knowledge use' is perceived as an outcome, as well as a process (Rich, 1997). The latter (process) relates to knowledge having a function in the policy process and the outcome of the policy process is not relevant for the definition of 'use'. The former (outcome) relates to the actual influence of knowledge on the outcome of the policy process.

How do we measure the *degree* of knowledge use?
Knott & Wildavsky (1980) developed a scale of seven levels for the degree in which knowledge is used (see *Figure 1*). Knowledge can, for instance, merely be received by policy makers (*reception)*, a report landing on a desk, for example, or actually be read and understood (*cognition*). Policy makers can refer to knowledge in their policy plans (*reference*), or make an attempt to accept knowledge, by discussing it in meetings (*effort*), for instance. Knott & Wildavsky refer to the adoption of research results within the choices and decisions of policymakers as *adoption*. Finally, the term *implementation* is used when the targeted policy will be implemented in actual fact, and the term *impact* is used as soon as the implemented policy shows the desired effects.

Level	Term	Description
1	Reception	Practitioners and professionals involved have received the research results
2	Cognition	The research reports are read and understood by the practitioners and professionals concerned
3	Reference	The research is cited as a reference in the reports, studies and strategies developed by practitioners and professionals
4	Effort	Practitioners and professionals have made an effort to include the results of the research in the policy, but may not necessarily have been successful in their attempts
5	Adoption	The research results have been adopted in the choices and decisions of practitioners and professionals
6	Implementation	The policy in which the research results have been adopted, has been implemented
7	Impact	The policy in which the research results have been adopted shows the desired effects

Table 1. *Levels of the scale of knowledge use based on Landry et al. (2001a), Lester (1993) and Knott & Wildavsky (1980).*

Which are the *types* of knowledge use?

In addition to the *degree* of knowledge use, different types of knowledge use can be distinguished. Various classifications were developed for various types of knowledge use in policy processes (for recent overviews, see Bax, 2011; Blake & Ottoson, 2009). On the basis of these studies, four types of use can be distinguished. Firstly, knowledge can be used *instrumentally*, with scientists as problem solvers. Knowledge providers deliver their research data routinely, policy makers use knowledge for making concrete, often small-scale decisions, and as legitimisation of established policy plans. Secondly, knowledge can be used *conceptually*, because knowledge can indicate new or unsolved policy problems. Scientists influence the policy agenda and 'enlighten' politicians hereby. In such cases scientists are idea providers or problem spotters. Thirdly, knowledge can be used *strategically,* to legitimize the opinions of policy makers and politicians. Knowledge producers can then be described as ammunition suppliers or advocates. Policy makers use this knowledge selectively for the sole purpose of legitimizing political statements. Fourthly, knowledge can be used to resolve policy *conflicts,* with knowledge producers in the role of mediator. Policy issues causing conflicts can be depoliticized by turning a political question into a technical one. Observing policy issues in a more general and abstract way and taking into account long-term perspectives helps scientists to play a mediatory role.

Which road safety knowledge do policy makers use?

Not much systematic research has been carried out into the use of knowledge in road safety policy. Bax (2011) studied in her dissertation the use of knowledge in policy processes in provinces and municipalities. She concluded that knowledge is extensively used in road safety policy: knowledge use could be measured on many levels of the Knott & Wildasvky scale and knowledge was used in various stages of the policy process. All provinces are familiar with the guidelines for infrastructure and the majority had taken note of the effects and costs of the measures. Many provinces implemented the road safety measures on their roads; 85% of the municipalities spontaneously mentioned the use of guidelines and manuals when constructing roads. At the same time, however, municipalities gave priority to interests other than road safety in 50% of their roads. These conclusions are supported by other national and international research. For instance, Boer, Grimmius & Schoenmakers (2008) studied whether provinces, municipalities and water boards used CROW guidelines. Practically all respondents (95%) used these directives. In Great Britain, 50% of the road safety professionals and researchers, when questioned, indicated to use road safety knowledge monthly (Department for Transport, 2008). European studies (Elvik & Veisten, 2005) investigated the use of cost-benefit analyses (CBAs) and cost-effectiveness analyses (CEAs) by policy makers and researchers. An average of one-third of the respondents turned out to base their policy priorities on CBAs or CEAs. In Northern Europe, this percentage was higher than in Southern Europe.

What factors play a role in knowledge use?

Many studies into the factors that influence knowledge use refer to the differences between scientists/researchers and policy makers. Caplan (1979) uses the *Two Communities* metaphor for this notion. He studied why policy makers use or do not use knowledge and found the explanation in the difference in culture between the world of policy and the world of science. There is an essential

difference in language, as well as in the interests and the remuneration systems of these two worlds. Leroy (2007) summarized the differences between science and politics in a convenient table.

	Science	Politics
looks for…	truth	power
is driven by…	Non/normative conviction	normative conviction
wants information with…	depth, focus on causes	speed, focus on remedies
wants information…	in detail	in outline
looks specifically for…	causes	solutions
quality based on aim for…	validity	acceptance
and on aim for…	reliability	feasibility
method for quality control …	peer review	public support

Table 2. *Differences between science and politics (based on Leroy, 2007)*.

Since 1980, researchers, inspired by this *Two-communities metaphor,* have looked for specific factors that influence the use of scientific knowledge in decision-making processes. It is noticeable that the factors found are of a highly diverse nature. Landry et al. (2001b) wrote an excellent reviewing article about this problem (see also Bax, 2011).
The factors can generally be divided into four groups:
1. *Dissemination conditions*: this group of factors takes as its starting point that knowledge is useful to policy makers and that the dissemination of this knowledge and its accompanying information is important. Dissemination efforts can increase knowledge use.
2. The *needs of knowledge users*: the needs of users with respect to timing, presentation, relevance, usefulness and implementability, but also research quality and the trust of policy makers in this quality take up key position. When knowledge is in line with the needs of the user, it is feasible that this exerts a positive influence on its use.
3. *Unilateral production vs. co-production* of knowledge: the assumption in this group of factors is that frequent interaction between researchers and policy makers or coproduction of knowledge will provide socially robust knowledge. It is expected that this robust knowledge will be used more often than knowledge that is produced unilaterally.
4. *Institutional factors*: the key issue here is that knowledge should correspond with the type of policy problem and with the institutional context of the policy field. When the knowledge-providing context corresponds with the policy field of the policy makers, this can result in a better use of knowledge in policy.

The above-mentioned groups of factors do not play an equal part in the use of road safety knowledge in the Netherlands. The group of factors relating to dissemination conditions (group 1) is found in international literature about the use of road safety knowledge, but not in research in the Netherlands. Bax (2011) and Boer et al. (2008) found indications of factors from group 2: needs of knowledge users. Within this group, the most common reasons for not using knowledge were: the fact that it was not possible to implement measures due to local circumstances and the abstract nature of the available knowledge. Furthermore, in this group, a lack of confidence in researchers and/or research results also played a role and policy makers and researchers turned out to have different ideas about (alleged) policy problems. Factors from group 3, unilateral production vs. co-production of knowledge, are neither mentioned in Dutch studies into the use of road safety knowledge, nor in international literature. However, these factors play a role in policy fields other than road safety. Various findings (Bax, 2011) indicate that the Netherlands actually applies a kind of coproduction knowledge: for instance, many guidelines for road safety measures are designed by both policy makers and researchers; and government organizations, such as ministries and decentralized governments, have a say in knowledge issues through financing research institutes.

The factors mentioned most often in Dutch as well as in international literature are the institutional differences between the worlds of knowledge and policy. Bax (2011) observed three institutional differences in the Dutch road safety field that influence the use of knowledge in policy.

Firstly, road safety policy is formulated on various government levels, whereas the greater part of knowledge production focuses mostly on the national level. This results in a greater need for specific knowledge for regional and local governments and for adoption of scientific knowledge into regional and local practice. Secondly, road safety policy is increasingly incorporated in other policies, such as traffic and transport policies. The world of policy increasingly looks upon road safety as being part of other policies, instead of being an independent policy subject. On the other hand, in research, road safety is often considered to be a separate subject. Subsequently, a need is felt for arguments and techniques to balance road safety against other interests and to integrate road safety in a broader policy field. Thirdly, research by Bax shows that the culture and the rationality of researchers and policy makers differ, as indicated above by Caplan. Although policy and knowledge come with their own rationality and role in the road safety field, this creates a need for knowledge on the application of political arguments in road safety policy.

Are options available to enhance the use of road safety knowledge?
It shows from the above that there is a difference in rationality between researchers and policy makers. In order to enhance the use of scientific knowledge in road safety policy, these differences in reasoning and interests should be taken into account. This way, it can be more successfully estimated which scientific knowledge will actually result in policy and in which way knowledge can be presented most effectively for use in the world of policy.

On the basis of the analysis of influencing factors in the previous section, Bax (2011) presented a number of recommendations. To begin with, more knowledge might be developed specifically for regional and local governments, in particular, knowledge about handling contradictory interests, such as road safety versus traffic flow, environment, landscape, driving comfort et cetera. Presently, this knowledge is only scantily available, but it shows from the studies above that there is a definite need. Moreover, according to Bax (2011), knowledge and policy can be geared towards each other more fully, if both parties openly communicate about expectations, desires, options and limitations of research, so that this will meet the needs of the user as well as possible. Elvis & Veisten (2005) list the possible communication topics between knowledge producer and knowledge customer (if the latter is the client):
- the question that the research should answer;
- the way in which results will be used and the types of presentation that match this;
- the moment when results need to be available and the consequences of delay for the decision-taking process;
- agreements about a mode of quality control, especially if clients cannot easily control the quality themselves. This may be an external expert or commission, for example;
- the way in which the client remains involved in the research progress in order to amend it if necessary.

Conclusions
Researchers and policy makers both attempt to enhance road safety and in doing so show their individual role and rationality. Scientific knowledge is widely used in road safety policy. Various factors are important for this use of knowledge, such as the requirements of policy makers with respect to timing, presentation, relevance, usefulness and implementability, but also with regards to the quality of the research and trust in this quality. Other important factors are institutional factors. Road safety *policy* is often decided on various government levels, focuses on integration of road safety in other policy fields and deals with political arguments. On the other hand, road safety *knowledge* more often focuses on the national level, on road safety as a separate issue and on technocratic arguments. As a result, scientific knowledge could be used more successfully in road safety policy if further knowledge were developed specifically for regional and local governments. Furthermore, researchers and policy makers attempt to take their differences in reasoning and interests more fully into account. Subsequently, it can be more successfully estimated which scientific knowledge will actually result in policy and in which way knowledge may be presented most effectively for use in the world of policy.

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