Implementing evidence-based policy in a network-setting

Dutch Road Safety Policy in a Shift from a Home to an Away Match

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Abstract

In order to improve road safety in the Netherlands, in 1992 the Institute for Road Safety Research (SWOV) developed the evidence-based 'Sustainable Safety' concept. Dutch road safety policy, based on this concept, was quite successful and seen as a best practice in Europe. Recently the policy context has changed from a sectoral policy setting towards a fragmented network, in which safety is a facet of other transport-related policies. In this contribution, it is argued that the implementation strategy underlying Sustainable Safety should be aligned with the changed context. In order to explore the adjustments needed, two perspectives of policy implementation are discussed: (1) national evidence-based policies with sectoral implementation and (2) decentralised negotiation on transport policy in which road safety is only one aspect. We argue that the latter approach matches the characteristics of the newly evolved policy context best, and conclude with recommendations for reformulating the implementation strategy.

Keywords: road safety policy, sustainable safety, implementation, policy networks, evidence based policy

1. Introduction

In the field of road safety, The Netherlands, along with Sweden and the United Kingdom, is considered a leader in Europe. The figure below shows the number of road deaths per 1 million inhabitants for EU member states in 2007.
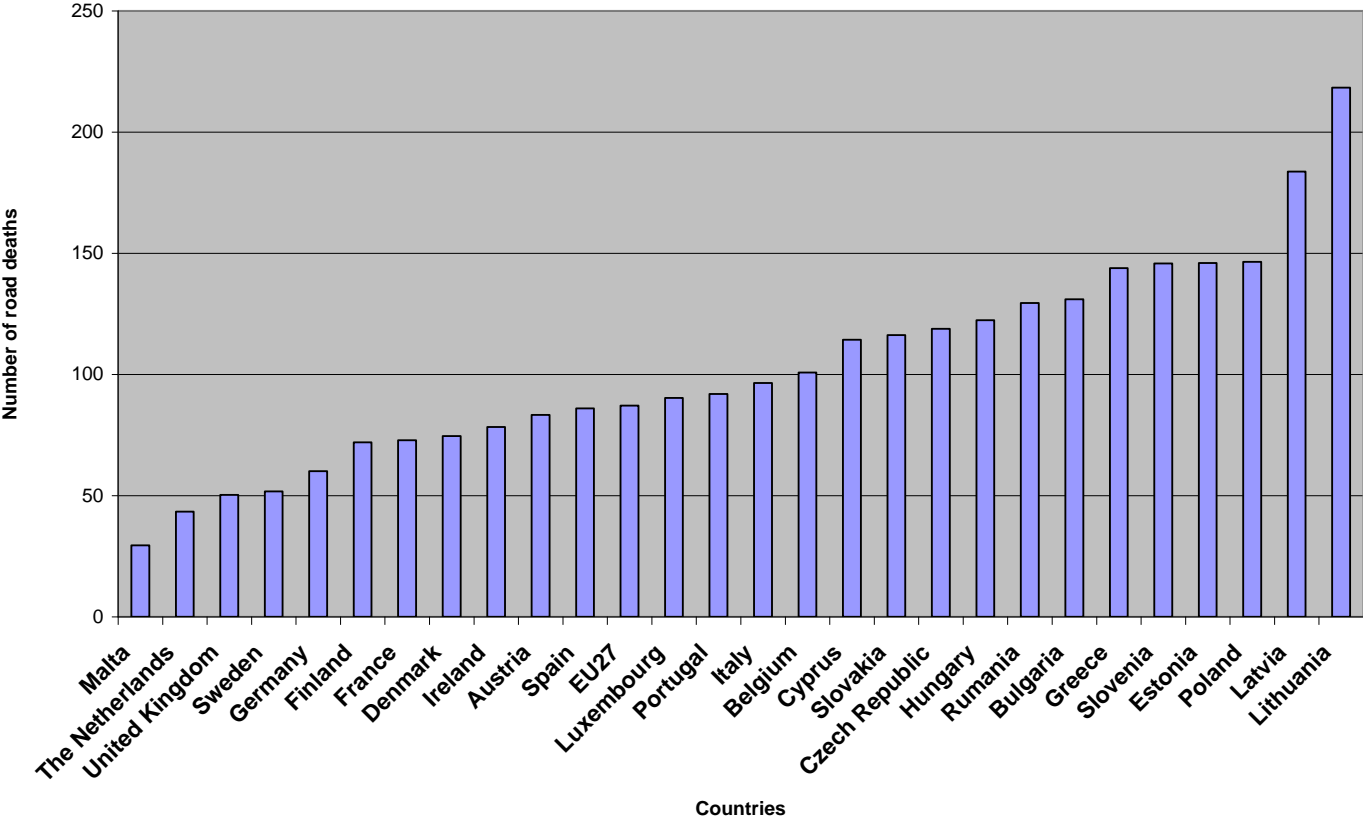

Figure 1. Number of road deaths per 1 million inhabitants for EU member states in 2007.

This success can be explained by several factors (Koornstra, et al. 2002). All three countries have taken the same types of measures in the past, such as the introduction of speed limits, mandatory use of seat belts and moped/motor helmets, improvement of vehicle safety and more recently the adaptation of the infrastructure to accident prevention. They each have set relatively similar quantitative targets (Wong, et al. 2006). Also, the general characteristics of the organisation of road safety activities are similar. In all three countries, there is a lively

debate about safety issues in Parliament, a central co-ordinating ministry, and a top-down coordination of safety activities from the ministry to the decentralised governments. There are funding sources, specifically targeting road safety and there exist influential non-profit organisations promoting the case. Another explanation for the successes in achieving road safety in The Netherlands and Sweden is the existence of an explicit vision for reshaping the road transport system and the characteristics of the organization of road safety activities. In Sweden Vision Zero, which was introduced in 1995, is based on the notion that not a single person should be killed or seriously injured in road traffic. Sweden tries to avoid casualties by making roads and vehicles safer and by adapting the traffic system to the reality that people make mistakes. These mistakes should not lead to any serious injuries or deaths (S.N. 2006). In the Netherlands in 1992, SWOV Institute for Road Safety Research introduced the Sustainable Safety concept (Koornstra, et al. 1992; SWOV 1993). The vision provided ideas for a nation-wide redesign of the (road) safety system, based on scientific findings.

Of course one might ask what the relative contribution of the concept was to the success of road safety policies. For instance, was the vision actually implemented according to plan? The Sustainable Safety concept certainly included an implementation strategy. This strategy aimed at the comprehensive realisation of the proposed evidence-based road measures. Nevertheless, the measures had to be implemented in a relatively decentralised network in which various governmental layers and bodies operated. Recently this network has become even more complex, since safety policy has become part of the more extensive traffic and transport policy network. This raises the question to what extent the implementation strategy matches the policy context in which the Sustainable Safe concept has to be realised.

In this article we will investigate the appropriateness of the implementation strategy of the Sustainable Safety concept, given the evidence-based nature of this policy vision and the (developments in the) policy context in which it has to be implemented.

This study has theoretical and practical relevance for at least two reasons. First it presents a theoretically driven empirical analysis of an implementation process within a policy context that develops from a relatively autonomous setting towards a fragmented network, in which objectives have to be realised as a facet of other policies. Since this development is not restricted to the road safety policy field, this analysis may have implications for implementation processes in general.

Secondly, the Sustainable Safety concept is a scientifically based, integrated programme. Implementation of this vision therefore relates to the topic of knowledge utilisation and especially the problem of the strategic use or non-use of knowledge in policy processes (e.g. Pawson 2006; Solesbury 2001). A challenging and generic question for the implementation of evidence based policies, is how these programmes like Sustainable Safety, can gain authoritativeness in network circumstances (Forester 1989; Grayson 2007; Jasanoff 1994).

In order to address the question of the appropriateness of Sustainable Safety's implementation strategy, first two theoretical approaches to the implementation of policies will be presented. These approaches will provide us with the analytical tools to analyse the implementation process and to assess the role of the strategy behind Sustainable Safety (section 2). Next, in section 3 the empirical description of the content, implementation and effects of the results of Sustainable Safety and its implementation strategy will be presented and confronted with the theoretical framework. Section 4 will discuss the implications of the findings for the implementation strategy of Sustainable Safety vision: to what extent and how should it be adapted? Section 5 presents the conclusions.

2. Theoretical approaches to implementation

In order to analyse the appropriateness of the implementation strategy of the Sustainable Safety concept, we need theoretical assumptions as to factors which influence the success or

failure of implementation and what strategies are supportive and which are not. These assumptions can be derived from theories on policy implementation. However, within the field of implementation studies, various theoretical perspectives on implementation processes exist, using different criteria to assess success, resulting in different and even contradictory explanations and recommendations. In this section we will present two important perspectives: evidence-based policy-making and interaction-based policy-making. Both occur in a multi-actor network context, but their primary focus is different.

2.1 Perspective 1: Implementation as evidence-based programming

In the perspective of implementation as evidence-based programming, implementation is seen as a scientific and intellectual activity, aimed at translating policy goals into a programme of measures and policy instruments to be operationalised and put in practice by executive organisations. Implementation problems occur in case of the partial, changed or completely omitted implementation of stated policies. This implementation gap is caused by the absence of precise policy objectives, offering implementers much discretionary power to deviate from the intended policy measures. As a result, policies founder on barriers within executive organisations and target groups. These barriers can be characterised as 'not knowing how to' (lack of proper information and communication), 'not being able to' (lack of competence and capacity), and 'not wanting to' (resistance).

Implementation strategies should therefore be aimed at specifying policy objectives, adapting policy programming to the characteristics of executive organisations and target groups (backward mapping), and limiting the discretionary freedom and veto power of these actors. In the extreme, this leads to the search for 'perfect administration': policy programming that takes account of every implementation contingency, so that the originally stated policy is

achieved as completely and consistently as possible (Elmore 1979; Mazmanian and Sabatier 1981; Pressman and Wildavsky 1973).

2.2 Perspective 2: Implementation as an interaction-based process

This perspective considers implementation as a coordination process between mutually dependent actors. It differs from the evidence-based approach, in that its approach emphasises interaction and negotiation processes among a variety of stakeholders. One source of inspiration of this perspective is the bottom-up approach of implementation, also called the 'open' approach of implementation (O'Toole 1988). The policy network approach is a second source. The network approach emphasises interdependence among players and sectors, as well as the need for cooperation and coordination (Kickert, et al. 1997).

In the interaction-based approach, implementation fails if rigid objectives and policy programmes leave executive organisations and target groups with insufficient room to adapt policies to specific circumstances and conditions; if insufficient resources are made available; and if policies do not line up with the objectives, opportunities and knowledge of other policy makers, executive organisations, target groups, and stakeholders.

This diagnosis leads to recommendations with a different focus than those of the first approach. In order to implement policies successfully, it is necessary to keep objectives and programming generic, to acquire support from actors, and to provide other actors involved in the implementation process with resources (such as funds and information) and opportunities to participate in the policy process in order to create support and to use their tacit knowledge for the improvement of the policy content (Kickert, Klijn and Koppenjan 1997).

2.3 Evidence-Based Policies and the Implementation Perspectives

As far as evidence based policy is concerned, the first perspective seems to be the most appropriate one. If policy is based on scientific evidence, it seems no less than natural and justified that it should be fully and coherently implemented. Deviation of this policy during the implementation process implies less effective policy outcomes. So efforts should be aimed at informing and convincing executive organisations and target groups about the need for these policy measures. Such an approach matches traditional ideas about knowledge utilisation. Knowledge precedes policy. Policy measures are based on scientific knowledge and then brought into practice. Unfortunately the problem of non-use of scientific knowledge in policies is notorious. The fact that a policy is evidence-based does not necessarily increase its chance to be implemented. Implementation failure still may occur.

According to the interaction-based perspective, political rationality is leading. Scientifically designed policies are traded off against other goals and policies, resulting in an implementation gap. Knowledge is strategically used and in the argumentation games that evolve, it is very hard for parties involved to distinguish what is true and what is not (Forester 1989; Grayson 2007; Lindblom and Cohen 1979; Patton 1997). The challenge for scientific knowledge, research and experts is how to become authoritative in the negotiations, resulting in policy outcomes that reflect negotiated knowledge: outcomes that are acceptable to the parties involved and hold given the prevailing scientific insights (De Bruijn and Ten Heuvelhof 2003; Jasanoff 1994).

2.4 The two perspectives and the policy context

No simple answer exists to the question which of the two perspectives is true. The two perspectives are not empirical theories which can be falsified by means of testing. They are

ideal-type approaches based on different logics and resulting in different normative positions that are true in their own sense.

However, we can presume that in some situations the use of one perspective is more suitable than the other. In order to implement policies according to the principles of the evidence-based programming perspective, a context is needed of vertical integration: in which a policy programme is coordinated from one policy perspective and the policy making body possesses the resources to influence the conditions under which implementing bodies operate. The interaction-based perspective of policy-making matches conditions in which vertical integration is weak, policies have to be realised in a setting in which various lines of argumentation compete and the resources of a policy making body to influence the behaviour of implementing bodies are limited.

2.5 *Applying the two approaches to the implementation of Sustainable safety*

With regard to the Sustainable Safety concept we will therefore characterise the implementation strategy in terms of the two implementation perspectives, and try to explain the implementation as a function of the match between conceptual vision and context. Eventually in section 4, we will use this framework as a point of departure to develop recommendations: how can the policy vision be adapted in order to strengthen the match with the policy context?

3. Implementing the Sustainable Safety concept

In order to make the analysis suggested in section 2, this section will characterise the implementation strategy underlying Sustainable Safety and compare it with the nature of the implementation context. Subsequently, we can determine whether the match or mismatch can explain success or failure during the implementation. In order to do so, sections 3.1 through

3.5 will describe the content of the Sustainable Safety concept and its implementation strategy, the implementation context, the implementation process and its effects. Then recent contextual developments are described in section 3.6. Section 3.7 presents the analysis of the appropriateness of the implementation strategy and explores the development of this match given the recent developments in the implementation context.

3.1 The Sustainable Safety concept

Sustainable Safety is an integrated approach to the traffic system consisting of three main components 'human', 'vehicle', and 'road' (Koornstra, Mathijssen, Mulder, Roszbach and Wegman 1992; SWOV 1993). The main goal of Sustainable Safety is to prevent (severe) accidents and if impossible, to diminish the chance of incurring severe injury. The starting point is the human being: his physical vulnerability, but also his capabilities (people make mistakes and do not always observe the rules).

In a sustainable and safe road traffic system everything is adjusted to the road user's limitations and capabilities. Road infrastructure should be designed in a uniform way according to scientific insights, eliminate dangerous encounters between road users and make clear to them how they should behave. Education must instruct a person for his traffic task, and finally enforcement should check if the participation in traffic is safe. Sustainable Safety aims at road safety measures that intervene as early as possible in the 'chain' from system design to, ultimately, traffic behaviour.

In the Sustainable Safety Vision, five principles are central:

Sustainable Safety principle	Description
Functionality of roads	Mono-functionality of roads, as either through-roads, distributor roads, access roads, in a hierarchically structured road network
Homogeneity of masses and/or speed and direction	Equality in speed, direction and masses at medium and high speeds
Predictability of road course and road user behaviour by a recognisable road design	Road environment and road user behaviour that support road user expectations via consistency and continuity in road design
Forgivingness of the environment and of road users	Injury limitation through a forgiving road environment and anticipation of road user behaviour
State awareness by the road user	Ability to assess one's own task capability

Table 1.The five Sustainable Safety principles briefly described (Wegman & Aarts, 2006).

The last two principles were added in the update in 2005. Especially the subjects of road user education, enforcement of traffic behaviour, and intelligent transport systems were further elaborated (Wegman and Aarts 2006; Wegman, et al. 2008).

3.2. The implementation strategy

Sustainable Safety is a scientifically based integrated approach to the traffic system. Koornstra e.a. (1992, p. 21; SWOV 1993) have formulated a strategy for the implementation of this generic concept. In general, this strategy implies intergovernmental task co-ordination with limited degrees of freedom for decentralised authorities, while sufficient monetary resources should be supplied to them. In order to realise an important principle of Sustainable Safety, a uniform outlay of the road infrastructure, a consistent implementation is required

that has to be maintained for many years. Sustainable Safety requires central coordination, whereby the policy discretion of the public organisations involved in the implementation to deviate from the sustainable safety concepts should be limited as much as possible. From this perspective, the diverging interests and perceptions of road users and public organisations are potential threats to the policy programme. Decentralisation policy, reduction of expenditure, and the deregulation of laws and finance are considered unfavourable (Koornstra, Mathijssen, Mulder, Roszbach and Wegman 1992; SWOV 1993; Wegman 2001).

3.3 The policy context for the implementation of the Sustainable Safety concept

Bringing the Dutch traffic system in line with the Sustainable Safety concept required policy-makers to deal with the specific contemporary policy context. What did this context look like? At the time of the publication of the Sustainable Safety concept in 1992, road safety policy in the Netherlands was organised as follows. At the highest government level, the European Union was primarily concerned with harmonising various sorts of rules and regulations. At the level of the central government, the Ministry of Transport was the leading actor, but other ministries such as the ministries of Spatial Planning, Domestic Affairs and Justice have competences on specific issues like the planning of new infrastructure and the enforcement of rules and regulations in the field of traffic and transport. The national government sets frameworks for the road safety policy of lower governments by publishing road safety policy documents and formulating (national) maximum numbers of road casualties. Besides this, it is responsible for the construction, maintenance and operation of national roads, for enacting road safety laws, and for national road safety campaigns.

The provinces and municipalities, and to a lesser extent the water boards, are the road authorities of most kilometres of road in the Netherlands. Using their own and the state's money they are responsible for their roads' sustainable safety. In the provinces, Provincial

Road Safety Boards deal with education, campaigns, and enforcement. Each of these Boards consists of representatives of provinces, municipalities, the police, the Public Prosecution Service, the Ministry of Transport, and social organisations. The Road Safety Boards create opportunities to exchange information between the various organisations, and to introduce their specific knowledge in the policy process. What is more, the partners often carry out road safety projects themselves, which they partly also finance themselves.

3.4 The implementation of the Sustainable Safety concept

In the past decade, Sustainable Safety has become the leading idea to improve the road safety in the Netherlands. Also internationally, it is seen as authoritative (Wegman 2004). Probably the most important step to implement it has been the Start-up Programme. A platform of interest organisations was set up which made a working plan to implement Sustainable Safety, and several regional demonstration projects were financed by the national government. This led to the Start-Up Programme Sustainable Safety in 1997, which was officially a covenant between the local, regional and national governments about the implementation of Sustainable Safety (S.N. 1997). In practice, it consisted of a package of 24 relatively quickly to implement road safety measures like the introduction of 30km/h zones in built-up areas, which were partly financed by the national government. For road safety measures in general, provinces received an earmarked payment, which they could divide among their municipalities. Policy plans, finances and visions were thus embedded in a sectoral road safety environment.

One can wonder whether the Start-Up Programme has been a good translation of the Sustainable Safety Vision. In the past years, the implementation of Sustainable Safety has mainly focused on infrastructure measures, not on the combination of human factors, vehicle measures and road measures. Although there certainly have been developments in vehicle measures and human factors, these were mostly not the result of the implementation of

Sustainable Safety (Wegman and Aarts 2006). Also, many measures, especially the 30km/h zones in built-up areas, are executed at a lower cost, which has led to less speed reduction than desired (Berends and Stipdonk 2009).

3.5 The success of the implementation of the Sustainable Safety concept

For lack of assessment, not much is known about the effects of the Sustainable Safety measures. Incidental reports show moderate to very positive effects of infrastructure measures (Wegman, et al. 2006). On this basis, the overall effect of all infrastructure measures taken in the Start-up Programme is estimated at minus 6% severe casualties (road deaths and severely injured). The effect of the construction of 30 and 60km/hour areas is estimated at a decrease of 60% respectively 40% severe casualties per kilometre in these areas. Compared to the Sustainable Safety goal of no severe casualties at all in these areas, the implementation might have been too sober. But in spite of that, the Start-up Programme can be seen as one of the causes of the good position of the Netherlands within the EU concerning road deaths.

3.6 Recent developments: the changing implementation context of Sustainable Safety

Since the start of the implementation of Sustainable Safety, the Ministry of Transport has altered its views of transport policy in general and road safety policy in particular. This changed the policy context for road safety. Road safety developed from a separate policy field to a facet of a more integrated traffic policy to be realised at the regional scale.

The environment in which the original Sustainable Safety concept was developed, was a sectoral one: road safety was a separate policy area, with a tradition of separate road safety policy plans, updated every few years (the most recent in the nineties, Ministry of Transport 1996). Sustainable Safety was immediately incorporated in road safety policy and it was

promoted by the national government among decentralised governments and interest organisations.

From 1997 on, the policy vision of the Ministry changed towards a more decentralised and integrated transport policy. Road safety no longer had separate policy plans, but was integrated into the broader National Traffic and Transport Plans (Ministry of Transport 2006). These plans were not only discussed in the road safety field, but broadly in the transport field. Road Safety was part of this broad plan and claimed a chapter of its own, next to subjects such as accessibility and the environment. Also the follow-up of the (sectoral) Start-up Programme Sustainable Safety was integrated in the National Traffic and Transport Plan, where it became a facet of transport policy. Another indication of the integration of road safety in traffic and transport policy and of the decentralisation policy was the major shift in financial planning in 2005: the earmarked road safety funds for provincial finances for the construction of sustainable safe infrastructure, educational campaigns, and enforcement are added to a lump-sum budget for traffic and transport. Since then, provinces are coordinators of the regional transport policy and road safety measures have to compete for their budget with transport measures (Wesemann 2003). Although in 2008 a (sectoral) National Road Safety Plan was decreed (Ministry of Transport 2008), its main policy pillars are integration of road safety in other policies and cooperation between governments, interest groups and market parties. Sustainable Safety is the third pillar of the Plan.

3.7 The implementation strategy and the success of the implementation of Sustainable Safety

The Sustainable Safety concept is a science-based integrated approach to the traffic system aiming at a uniform outlay of road infrastructure.

The implementation strategy initially consisted of a centralised approach aimed at a coherent and comprehensive implementation of policy measures to be continued for many years. This approach fits the characteristics of the evidence/based programming perspective. The question is to what extent this perspective was fruitful, given the results of the implementation and the policy context. The description of the implementation of Sustainable Safety indicates that the implementation strategy neglected important aspects of the policy context. Actually, parties involved in the implementation of the Sustainable Safety concept immediately experienced the limitations of the implementation strategy, and had to improvise. In doing so, an implementation strategy-in-use emerged, derived from the original strategy-in-theory. The policy measures had to be negotiated with sub-national governments in a network-like setting. During the adaptation of the policy, sub-national governments and other stakeholders were involved, resulting in the selection of measures that only partly contributed to the realisation of a traffic system as planned. During the actual implementation at the local level, sustainable safety measures were implemented at a low-cost, suboptimal way, due to cost-effectiveness considerations.

Yet parties involved agreed on implementing the vision and to a large extent policy measure were indeed implemented. Viewed from this angle, the implementation of the sustainable safety vision, although not comprehensively and not exactly as planned, was reasonably successful. This relative success may be explained by the fact that although the implementation context was relatively decentralised, the degree of vertical integration was still impressive. The package of road safety measures was accompanied by a national subsidy for decentralised road authorities. Decisions on road safety measures were taken in a relatively autonomous and coherent policy sector, in which the competition with other policies and perspective was attenuated and involved actors had common views. The world of road safety in the Netherlands has always been relatively well and tightly organised.

Professionals and policy makers in governmental and non-governmental organisations at the central and sub-national levels have the same background and the same frame of reference. Seen in this way the implementation strategy was, although not completely appropriate, matching at least some of the features of the policy context. A substantial amount of central coordination still existed. At the central level, detailed road safety policy plans were established and decentralised governments could be steered in the right implementation direction with earmarked payments for a group of predetermined road safety measures.

Viewed from an evidence-based programming perspective, despite the relative success of the implementation of the Sustainable Safety concept it can be argued that the ambitions of this programme have not been completely met. Further improvement of the effectiveness of the policy solutions might be sought in the direction of enhancing the central guidance of the Sustainable Safety concept, reducing the influence of decentralised governments at that level and limiting the possibilities of the latter to deviate from central policies, as some proponents of sustainable safety have suggested (Wegman 2004).

However, as we saw above, the Ministry of Transport changed the nature of the policy context weakening conditions for centralised programming and strengthening those for policy integration at the regional level. Due to the increased fragmentation of the sector, Sustainable Safety increasingly requires consultation with a large number of actors, in arenas in which safety is not the only interest taken into account. Road safety can no longer draw up its own policy plan without considering policy subjects such as congestion and the environment. It also no longer has its own subsidy programmes, but lump sum funding for transport. As a result, the relevance of the original implementation strategy has diminished even further. We would argue that this does not necessarily mean that pre-conditions for success of Sustainable

Safety have deteriorated. What is needed, however, is a rethinking of the implementation strategy to align it with the changed policy context. This can be done by using the interaction-based perspective of implementation as a source of inspiration. In the next section we discuss the implications of this proposition.

4. Discussion: Rethinking the implementation strategy for Sustainable Safety

Below, the implications of the changing policy context for the implementation strategy of Sustainable Safety are discussed, using the interaction-based perspective as a source of inspiration. This perspective implies that implementation should not be seen as a scientific activity, consisting of activity programming of evidence- based policy measures. Rather the implementation process should be considered a comprehensive interaction game between interdependent actors with different stakes trading off their policy wishes with each other. In this setting, there may be a chance that sustainable road safety is indeed traded off against other interests, and compromises are agreed upon that do not match the evidence upon which the Sustainable Safety concept is grounded. So the challenge is to formulate an implementation strategy aimed at reconciling diverging interests involved in road measures, resulting in win-win outcomes. Also, since scientific knowledge regarding sustainable safety will not automatically be authoritative and relevant in these settings, implementation activities should be aimed not at claiming but at gaining relevance and authoritativeness. Below we suggest how this can be accomplished by discussing the changed nature of the implementation game and the repercussions this should have for the role of the policy contents, the actors involved, and scientific knowledge.

4.1 Implementation of Sustainable Safety as a home or away game

Sustainable Safety measures are more and more determined within the framework of broader traffic and transport policy. At the various government levels, interaction with other sectors is inevitable. Sustainable Safety is less frequently a home game but has instead become an away game. Playing away makes the implementation of Sustainable Safety more difficult. Road safety policy makers have to be involved in the networks of traffic and transport policy and spatial planning, and promote and negotiate the road safety interests. Sometimes certain road safety measures will be abandoned because of for instance accessibility policies (Bax and Jagtman 2008). Cost-benefit considerations may result in the rejection of certain road safety measures. This broadening of scope is not only disadvantageous, though. It also offers new opportunities. However it requires a more open attitude. Instead of competing with other interests, it can be more profitable to connect Sustainable Safety measures with the objectives and policy measures of other actors and other sectors (Brandenburger and Nalebuff 1996). For example, sustainable safety measures, which are too expensive to be realised by themselves, now often are combined with the maintenance of sewerage (Jagtman and Louwerse 2007). Cost-benefit-analyses can help to convince actors of other policy fields of the necessity to support Sustainable Safety measures (SWOV 2008).

4.2 Sustainable Safety: implementation programme or sensitising concept?

Until recently, supporters of the Sustainable Safety concept saw it mainly as an implementation programme. However, this seems to be at odds with the current circumstances and the implementation recommendations we made before. This does not mean that the idea of Sustainable Safety as a set of substantive, coherent and scientifically grounded policy measures has to be abandoned. Regional governments, for instance, use the concept to screen their road safety policy (Aarts 2008) and foreign observers regard Sustainable Safety as a

'strong brand' of which they are slightly jealous (Wegman 2004). Uniform implementation of Sustainable Safety is however very difficult. In 2003 and 2004, the various government levels tried to agree about the essential road features per road type. They only succeeded in an agreement on road marking, and even here, the implementation shows great variety (SWOV 2007).

Implementation as a facet of a broader policy does not exclude uniformity, or the adoption of measures that are scientifically founded. However, local knowledge is indispensable to adapt the uniform package of measures to specific conditions. It is therefore important to recognise that the implementation of Sustainable Safety measures requires a certain amount of discretionary freedom. Sustainable Safety measures should be developed in dialogue with sub-national governments. This can for instance be done by gaining the commitment of these authorities through the creation of road safety agreements aimed at realising the standards of the Sustainable Safety concept (Wegman 2004). These standards have to be developed and made explicit. If this is accomplished, the quality of locally elaborated measures needs to be tested according to the Sustainable Safety standards.

Moreover, Sustainable Safety as a 'strong brand' could also fulfil a role as a sensitising or mobilising concept, that encourages actors to think about road safety and by doing so, encourages them to perform better in this respect. It should then be accompanied by the exchange of experiences and the identification, communication and further development of 'best practices' (compare Koppenjan and Klijn 2004).

4.3 Playing the new game: new roles and new allies

In the new fragmented environment of Sustainable Safety, the role of the national government has diminished (Terlouw, et al. 2001). This is considered problematic by proponents of Sustainable Safety, because they traditionally expected the government to take the lead in the

implementation of the Sustainable Safety concept. Remarkably, local and regional authorities recently appear to emerge as important road safety advocates. In the decision making process for the Dutch National Traffic and Transport Plans (NVVP and the Mobility Policy Document) they frequently emphasise the importance of ambitious targets and adequate financing (Bax 2006). It may well be that in the coming years not central government, but regional and local authorities prove to be the natural allies of Sustainable Safety. In a multi-actor context, success depends on the ability to build supportive coalitions (Crosby and Bryson 2005; Sabatier and Jenkins-Smith 1993). In order to implement the Sustainable Safety concept under the new circumstances, the coalition supporting the policy needs to be renewed. In the new constellation, provinces and regional authorities have become important policy makers. They fulfil a central role in the regional road safety policy and distribute the lump sum financing among municipalities. Provinces can become the playmakers by linking the agreements made in consultations to the allocation of the lump sum finances. Performance agreements and benchmarks may be appropriate instruments in this respect. To determine the quality of road safety proposals and performance, provinces can commission assessments by auditors. In addition, the provinces can adopt the role of knowledge broker by encouraging the dissemination of knowledge, innovative ideas, and 'best practices' among municipalities and between safety regions (Agranoff and McGuire 2003; Mandell 2001). The Ministry of Transport can continue to play a central role in setting national road safety standards and regulations, as the road authority of the national roads. The most important non-governmental organisations supporting road safety, the Dutch Traffic Safety Association (VVN) and the Royal Dutch Tourist Club ANWB, should articulate road safety interests in various decision making processes. Since fragmentation of the policy arena makes this job more difficult than before, they are in need of new strategies. For instance, they might use the Sustainable Safety concept to link up with the influential lobby of environmental groups.

4.4. The role of scientific knowledge: sequential versus parallel connections

From the perspective of sustainable safety the major risks of a fragmented policy implementation are that the negotiated road safety measures are ineffective and experts and knowledge institutes are not heard.

The challenge for experts and knowledge institutes is to ward off 'negotiated nonsense' and realise policy measures that are tenable in the light of scientific knowledge: 'negotiated knowledge' (De Bruijn, et al. 2002). However, to be authoritative, knowledge and experts have to be linked in a new way to the implementation process (De Bruijn and Ten Heuvelhof 2003; Jasanoff 1994). Evidence based policies are not automatically authoritative. Complementary to their traditional role as policy adviser, suggesting policy measures on the basis of research findings, experts could facilitate the different actors that are involved in the implementation process by providing answers to the questions these actors run into during the process of policy implementation. In addition, they may develop Sustainable Safety standards and test the quality of locally elaborated road safety measures in light of these standards. This should result in the establishment of Sustainable Safety as a quality assurance system, which guarantees the quality and coherence of road safety measures in a fragmented implementation setting.

4.5 Matching the implementation strategy and the fragmented policy context

Table 2 summarises the implications of the interaction-based approach for the implementation strategy of the Sustainable Safety Vision by setting it off against the original implementation strategy.

Original implementation strategy (rational programming perspective)	Redesigned implementation strategy (based on the interactive process perspective)
Sustainable Safety is an effective concept that has to be implemented as completely and uniformly as possible.	Sustainable Safety is not a static, uniform concept, but has to be operationalised in dialogue with implementing organisations. It is also a steering concept, used to promote road safety in agenda-setting processes.
Central steering by earmarked funds and sectoral policy plans is the best guarantee for a complete and uniform implementation.	Central steering leads to adaptation problems and repels potential partners. Decentralisation and fragmentation offer opportunities to build a new supportive coalition.
Fragmentation is unfavourable for a uniform and coherent implementation.	Linking sustainable safety with other goals and policies create new opportunities for implementation.
Research institutes contribute to the content of Sustainable Safety based on their scientific knowledge.	Knowledge about Sustainable Safety facilitates regional and local authorities and other actors in developing and implementing measures with road safety impacts.

Table 2. The implementation strategy of Sustainable Safety and its redesigned version

5. Conclusions: implementing evidence-based policies in network-settings

This article has addressed the question to what extent the implementation strategy of the Sustainable Safety concept was appropriate given the nature of the policy and the characteristics of the implementation context. We ascertained that Sustainable Safety initially consisted of a science-based policy concept requiring an implementation strategy according to which decentralised authorities were to implement policy measures with as little policy discretion as possible. The actual implementation, however, was not as strict as envisaged, both due to negotiation processes with decentralised authorities and cost considerations. Still

the strategy was relatively successful, the vertical integration of the various policy actors was strong, the policy community homogeneous, while the number of other actors was relatively small.

This situation has changed in the past few years. The policy context of Sustainable Safety has shifted because of a changing policy ideology of the Ministry of Transport, into a more decentral and fragmented network-setting, in which road safety increasingly has to compete with other aspects of traffic and transport policy. Given this change, the road safety sector will have to reinvent the implementation strategy underlying the Sustainable Safety concept. In the discussion we have suggested adaptations inspired by the interaction-based perspective. Due to the fragmentation of the policy setting, the implementation of sustainable safety has become a new role-play, requiring actors to perform new roles and to obey new rules. The implementation strategy should recognise that the policy context in which Sustainable Safety is implemented has changed from a home game into an away game in which actors are not only concerned with safety, but make trade-offs between various competing policies and their underlying values. Within this game-setting, the strategy should be aimed at ensuring that road safety is represented on an equal footing with other transport-related interests. This is a prerequisite for outcomes that are cost efficient, are well-integrated in other policy-measures and the broader environment, and hold in the light of the existing scientific insights. Building blocks of such a strategy are:

- preserving the Sustainable Safety concept as a strong branch, using it not exclusively as an implementation programme, but rather as a sensitising concept and a guiding principle,

- defining and allocating new roles for actors and building new coalitions to represent sustainable safety in away games in heterogeneous policy arenas, and

- developing new ways of linking the production and use of scientific evidence in policy making and implementation.

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