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Gaming Approach Route 26: a combination of computer simulation, design tools and social interaction

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Abstract

Many policy problems in the field of urban planning and traffic management are to be characterized as 'ill structured problems', i.e. there is little consensus about 'goals and facts'. The policy making process for such problems is a learning process, a continuous search for acceptable goals and relevant knowledge. In the past year we have been asked to help facilitate a policy making process, aimed at solving such an 'ill structured problem': the congestion problems in and around middle scale cities which are also faced with a substantial challenges for spatial planning. In our workshop design we used gaming techniques combined with a traffic simulation modell (Paramics) and our spatial designing tool Smartmap which is facilitated with an interactive white board (Smartboard). The simulation workshop was successfully tried out on a group of representatives who are usually involved in regional traffic and planning problems. Representatives of the national government as well as Chamber of Commerce, environmental groups, local governments, transportation enterprises, employers and consumer organizations were present, each playing a different role.We used a fictional, non existing region (Maasmere) and fictitious roles. Yet the simulated problems in this region and the present roles in the game are derived from real life sitautions and thus recognizable for the participants.In short, Spelaanpak Route 26 (in english Gaming approach Route 26) uses computer simulation and designing tools for which input is generated by the social interaction between group members. They have to negotiate the input for the simulation runs and for the spatial designs.The experiences of this try out are being used to improve and sharpen our design. E.G. we have learned that the planning focus (short term vs. long term) is a crucial bottleneck in solving the problems described above. In the improved version of the simulation workshop, the short term and long term planning assignments haven

been given a more important place.It is our aim to apply our simulation workshop to a real situation: a Dutch region with actual congestion and planning problems which solution involve a pluriform participation from the policy network. In our opinion the simulation workshop can play a role in the policy process phase of problemstructuring. The simulation approach will lead to identification of the main policy issues: what are the percieved problems, can we reach an agreement on what our problem is, what are possible and acceptable policy options, and so on.

Keywords:

Gaming/simulation; Interactive Policy Making; Learning Processes And Feedback Structures.

Introduction

1.1

Over the past decade, participatory or interactive policy-making has been fortunate enough to enjoy increasing interest on the part of both national and regional authorities in the Netherlands. This approach is apparently regarded as a panacea for obvious shortcomings in accepted practice, an approach that is typically obscure and unable to muster the driving force required of it. Consultation, the reconciliation of viewpoints and dialogue feature strongly in Dutch administrative culture and partly as a result of this, the step towards greater participation in policy-making is ostensibly easy and obvious. Yet, criticisms have been aired about the results of interactive, open policy-making processes. Statements such as 'the polder model has reached its limits' and pleas for a government that acts in the foreground and visibly assumes its responsibilities to a greater extent in place of exuding a retiring presence appear to indicate that the use of an interactive approach to policy-making is not undisputed. We see these 'reactions' nonetheless as a temporary trend in which 'a step back is taken before three steps forward are taken with the benefit of experience'. The reflective step back, in our opinion, leads us to make a better-substantiated choice as to the problem situations in which a more interactive approach is necessary; in contrast to those requiring a more closed approach. The breathing space also offers the chance to consider the form the interactive processes must take and how they should be supported. Both considerations are central to this paper and are elaborated on using an example: the Gaming Approach Route 26.

1.2

In section 2 the option of an interactive policy-making process is substantiated along with an indication of the learning processes that are involved in such a process. Section 3 focuses on the methodical support for the interactive policy-making process, and the gaming approach developed within the framework of this project is described. Particular attention is paid to the feedback structure that can be regarded as an essential element of the gaming approach. In sections 2 and 3 a link is made to the Route 26 project that serves as a testing ground for this development. In section 4 the most important conclusions are reported; and a number of suggestions for improvement and further development to the approach are provided.

1.3

This research project is being carried out within the framework of Roads to the Future, an innovation programme by the Dutch Ministry of Transport, Public Works and Water Management. This innovation programme is described briefly in the paragraph below.

Roads to the Future

1.4

Roads to the Future is an innovation programme by the Dutch Ministry of Transport, Public Works and Water Management. The aim of this programme is to devise, elaborate and, through pilots, test innovations in the transport system. These innovations are intended to enable a better and more intelligent use of the road network. Involved in the innovation programme alongside the specialist services of the Ministry are external experts, interest organisations, and users of the road network. The innovation has a thematic structure. The four themes that are central to the current programme relate to:

- Flexible Infrastructure;
- Virtual Mobility;
- Road architecture 2030;
- Road surface for the future.

Flexible Infrastructure

1.5

An important characteristic of our society is the continual changes that take place within it, be they economic, social, cultural or technological. These changes result not only in the further development of a particular sector, but also in an increase in the interaction and inter-relationship between the various sectors. The result is a society that is increasing in complexity. In such a society, it must also be possible to tailor the infrastructure to the continually changing needs of users.

1.6

These needs find expression in the fields of safety, environmental quality, convenience of use, reliability, and so on. Based on these user requirements, sustainable solutions can be devised with which it is possible to increase the social return on investment in infrastructure. The situation in the Netherlands and many other countries forces us, however, to append the following comments:

- we must acknowledge first and foremost that it is particularly difficult to sketch a picture of society in the future; aside from developments in the various sectors, we have the constantly changing attitudes of groups within the population;
- society is increasingly diverse and all sorts of social groups are demanding more frequently a role in the decision-making surrounding infrastructure. Unfortunately, the practice of decision-making has not kept pace with developments in society. The result is a high degree of rigidity in the decision-making surrounding the realisation of infrastructure projects.

1.7

In the Flexible Infrastructure project and especially in the Route 26 approach, these two problems are addressed. The aim of Route 26 is to find new solutions for difficult bottlenecks. Route 26 aims to break the stalemate by increasing the room for manoeuvre in seeking a solution, both in terms of content as well as process. To this end, two modules have been developed within the framework of Route 26:

- a toolbox;
- an open process invitation.

A substantiated choice for interactivity in policy-making

When interactive and when not?

2.1

Answering the question of when to apply an interactive approach becomes increasingly pressing when the results of this form of policy development disappoint. This approach is apparently not suited to all problem situations and it is advisable to find out in advance if the approach has to be interactive and, if so, to what degree. In order to identify the problem situations in which interactive policy-making is appropriate, we use a known typology for problem situations (from: Douglas and Wildavsky 1983, Hoppe 1989, Van de Graaf and Hoppe 1989, Hendriks, Tops and Hisschemöller 1998). The typology is constructed along two dimensions that together characterise a problem situation: the degree of consensus about values / objectives and the degree of consensus about facts / knowledge. The first dimension tackles the question: is there consensus about the knowledge that is meaningful for the solution of the problem? Our focus here is on ***empirical elements*** such as situations, facts and knowledge. The second dimension tackles the question: is there consensus about the values and objectives that are important to the plan? Key to this are ***normative elements*** such as values, standards, objectives, principles and ideas. Using this classification, four types of planning problems can be identified: unstructured, reasonably unstructured, cannot be structured and structured policy problems. These are schematically presented in figure 1.

	Little consensus about the values and aims involved	***High de the valu***
Little consensus about the knowledge involved	*Unstructured problem* *(1)* Policy-making as learning: → very suited to interactive policy-making	*Reason* Policy → inte
High degree of consensus about the knowledge involved	*Problem cannot be structured* *(3)* Policy-making as pacification: → limited suitability for interactive policy-making	Polic → unsu

Figure 1. Four types of policy problems, four strategies for policy-making and the extent to which they are suited to an interactive approach (from: Hendriks, Tops and Hisschemöller, 1998). Derived from: Douglas & Wildavsky, 1983.

Unstructured policy problems[1]: a closer look

2.2

Unstructured policy problems (from: Hendriks, Tops and Hisschemöller 1998) are referred to in various ways in the literature. Van de Graaf and Hoppe use the term 'indomitable policy problems', Mason and Mitroff (1981) talk about 'wicked policy problems', Ackoff talks of 'problems messes', Mitroff and Sagasti (1973) make a distinction between good, average and ill-structured policy problems, Braybrooke and Lindblom (1963) note that the badly structured problems in particular belong to the territory of government policy. Dunn regards complex policy problems as 'systems of problems' and indicates that the principal characteristic of these ill-structured or 'difficult to structure' problems is that they are a conflict situation between incompatible objectives.

2.3

Unstructured policy problems are highly complex both in terms of their intrinsic knowledge and their process. The ***intrinsic knowledge complexity*** stems from the coherence between various content themes. The themes environmental planning and traffic and transport are intrinsically interwoven and also have relationships with and effects on other intrinsic themes such as water management, environmental management and nature development. Interference with the one theme has consequences for another; but all too often, a buck-passing mechanism is at work. A solution is found for one theme that creates problems for another. Viewed from the perspective of intrinsic knowledge, unstructured policy problems have a 'system character' (Ackoff 1974; Dunn 1994; Geurts and Vennix 1989).

2.4

The ***process complexity*** finds expression in the number of public and private parties involved at various management and/or other levels, all of whom wish to see their interests reflected in the problem definition and the solution. The parties are highly interdependent in the process of seeking a solution and form ever changing coalitions to protect their interests. To influence one another, they display strategic behaviour within policy arenas (Teisman 1992). From a process perspective, unstructured policy problems take place within changing networks of parties.

Maasmere as unstructured problem

2.5

The fictional location of Maasmere around which Gaming Approach Route 26 revolves exemplifies the typical spatial and traffic situation in and around medium-sized Dutch cities (50,000 to 200,000 residents). These cities have reached their physical limits, exhausting all possibilities for residential and work locations. The capacity of the road infrastructure in and around the cities is increasingly inadequate. In addition, other policy themes related to environmental planning and traffic and transport are important. These themes include reducing environmental pollution, the quality of life, the accessibility of the town centre, reserving water storage capacity, improving traffic safety and ecological protection.

2.6

The parties involved are divided as to the manner in which this cluster of problems should be approached and the goals that should be set. They represent various social values. They strive for diverse and sometimes conflicting aims, and base their input on differing insights and sources of information.

2.7

The question is: Should the efforts solely be aimed at solving the congestion problem or should the problem be broadened by taking into account the future physical development of the city and / or issues of environmental protection and quality of life? In other words, the final goals of the policy making process is subject to ongoing discussion and negotiation. Therefore the question of which problem should be solved remains uncertain.

2.8

This short description shows that the Maasmere case study qualifies as an unstructured policy problem, if only by virtue of the fact that experience shows that this type of problem still cannot be solved satisfactorily. There is apparently an enduring difference in opinion as to what must be solved, i.e. the necessary aims, and the sources of knowledge that should be drawn upon to achieve this.

An interactive approach to unstructured problems: the strategy 'policy-making as learning'

2.9

In '*Handreiking Interactieve Planvorming' (guide to interactive planning)* (Duijn and Drogendijk (eds) 1999) it is suggested that 'unstructured problems lend themselves best to interactive policy-making because this affords the space to interactively evaluate the problem situation, formulate and reformulate policy objectives and to explore policy options. A vital condition, however, is that it must be possible for all parties involved to experience the problem situation. All parties must participate in it'. An unstructured problem implies the recognition, at the decision making level of disagreement or uncertainty, as to values and policy objectives as well as the knowledge considered relevant. Those who consider themselves involved have the opportunity to participate. They do this based on their own insights and interests, not primarily as representatives of some or other group. Characteristic of the unstructured problem is the identification, confrontation and, where possible, integration of conflicting insights into the problem at hand. This is called problem-structuring (Dunn 1994; Geurts and Vennix 1989).

2.10

An interactive approach to policy-making can best be organised in accordance with the policy-making as learning strategy (see figure 1). Policy-making as learning is primarily a social process in which participants are confronted with the 'reality' behind the views of others. They are enabled to imagine themselves in the position of the other party. This gives rise to new insights into the problem and new objectives for policy-making. Furthermore, parties begin to see their own interests in another light. This is where the most important difference exists from, for example, the strategy 'policy-making as negotiation', in which the various interests are regarded as givens. Policy-making as learning assumes a high degree of participation and an equal contribution from parties in the process. As well as the contribution of experts, the practical knowledge of local interested parties is a valuable contribution. Policy-making as learning assumes a high degree of involvement by elected political decision-makers.

2.11

It then becomes relevant to consider how the interactive policy-making as learning strategy can be fleshed out and supported. It is important to first consider the concept 'learning'. Indeed, interactive policy-making can be regarded as 'multi-actor or multi-organisational learning'. In that case it is a stimulating learning in an effective manner

within a multi-actor environment or policy network. That places requirements on the methods and instruments.

2.12

First, however, let's look at 'learning and learning processes'. A distinction is often made between two types of learning: single loop learning and double loop learning. The first term applies to the learning cycle of Kolb et. al. (1991), in which strong emphasis is placed on learning through experience. If learning is to take place, four phases must be experienced that together form a cycle. The cycle starts with concrete experience. The second phase consists of the observation of and reflection on these experiences. One reflects on what one has experienced. In the third phase reflection develops into analysis and the conceptualisation of the experiences. In this way, an attempt is made to understand the experiences. In the fourth phase, the subject experiments with the new insights. The experiments give rise to new concrete experiences on the basis of which the cycle begins again. In single loop learning, the 'how' question is central. It is a case of learning by doing, in which the behavioural changes are on the level of doing the same thing better (De Caluwé et. al. 1996).

2.13

Double loop learning (Argyris and Schön 1978) has the same cycle but adds another cycle or loop to it with the intention of learning about the way in which learning takes place. This is put up for discussion and possible ways of supporting the learning are sought. The capability and incapability of individuals and organisations to learn must be involved in that process. The principal aim of double loop learning is to achieve renovations and innovations rather than improvements.

Learning in policy networks: generating 'mode 2 knowledge'

2.14

The aim of 'learning in a multi-actor environment' such as a policy network is to achieve renovations and innovations. Renovations and innovations are necessary to reach a solution for complex policy problems; traditional solutions are no longer effective and/or acceptable for the network parties involved. In addition to this, the observation that scientific knowledge alone cannot be regarded as sufficient in the solution of complex policy problems is justified. The input of practical knowledge is vital. It appears, moreover, that practical knowledge is not merely derived from scientific knowledge but is independent of it and provides new and useful insights (e.g. Lévy-Leboyer 1986). Gibbons et al. (1994) call this type of knowledge 'mode 2 knowledge'. Mode 2 knowledge differs from knowledge gained in the traditional scientific way on a number of points:

- The 'knowledge production' takes place in a application-oriented context and is done by practical experts (policy-makers, interest groups, etc) who work in this context;
- The knowledge generated is transdisciplinary: the data (input) and the results (outcomes) lie outside the territory of any single discipline;
- It employs different types of quality control, being more socially accountable and reflexive.

2.15

As well as an instrumental character, the application of both scientific and applied knowledge also has a conceptual character. Knowledge is used not only for the

preparation of concrete knowledge products such as advice and decisions, but also to better understand the dynamic environment, to reconsider traditional solutions or to discover new chances in the form of measures and approaches.

2.16

Learning in networks can be regarded as generating mode 2 knowledge. Alternatively 'the production process of mode 2 knowledge' is an apt way of describing the learning process within networks. This learning process not only results in new application-oriented knowledge but also leads to insights into the way in which policy is made in a dynamic network environment.

2.17

The network functions as the bearer of the learning process in which the participants are the knowledge bearers (from: Innovating and Learning, NRLO report 99/13 1999). The learning process in a network can be regarded as a process of co-makership of knowledge products such as policy visions, implementation programmes, and so on. The composition of the network, the capacities of the participants and the extent of agreement within the network about the concepts and frames of reference to be employed determine to a large extent the quality of the knowledge products generated.

2.18

The diffusion of knowledge appears to happen in diverse, sometimes inimitable ways. That is certainly true of the spread and exchange of knowledge within policy networks. Each policy participant contributes his own sources of knowledge. Often, knowledge first 'resides' in a reservoir before being discovered by accident by potential users and applied (Ter Heide and Horrevoets 1996). Such 'knowledge reservoirs' are not only fed by scientific knowledge but also by the tacit knowledge (see also: Nonaka and Takeuchi 1995) of hands-on experts within policy networks.

2.19

To summarise, we can state that many complex problems in the interdependent policy fields of 'environmental planning' and 'traffic and transport', as described in the fictional Maasmere case study can be classed as unstructured problems. An interactive policy-making process is, therefore, the most appropriate approach. The interactive approach is fleshed out in accordance with the 'policy-making as learning' approach. This strategy is a learning process about a search for values and objectives to aspire to and for useful facts and knowledge. Given the network environment of many participants and many interactions, this learning process must be considered as 'multi-actor learning'. Within that, the network is the bearer of the learning process and the participants the knowledge bearers.

The methodical support of interactive policy-making

Policy-making as learning: a gaming approach as method

3.1

In elaborating on the preceding theme it becomes relevant to ask how policy-making as learning can be methodically supported. We have opted for a gaming approach in which experimentation with policy is the guiding principle. With the aid of a gaming-inspired approach, participants in the future policy process are enabled to break free of their traditional manner as 'the policy network' of looking at problems and solutions. We aim to place creativity, innovation and experimentation at the heart of the process.

3.2

By the term 'gaming approach' we explicitly adhere to the body of thought about game simulations (Duke 1974; Geurts and Vennix 1989; De Caluwé et al. 1996) and policy exercises (Brewer 1986; Geurts 1993). We have worked into our Gaming Approach Route 26 a number of the elements of game simulations and policy exercises mentioned in these sources and adapted them for the pattern of problems in Maasmere. These elements are:

- An abstracted model of the interwoven policy fields of 'spatial development' and 'traffic and transport';
- The creation of a safe environment that relates to a recognisable body of problems;
- Representation of the network of actors: participation by representatives of the most involved parties;
- Representation of the crucial interactions between the involved parties;
- Social interaction between the participants as the 'driving force' of the simulation;
- The stimulation of 'single loop' and 'double loop learning' by structuring feedback tailored to them.

3.3

The gaming approach is built out of two consecutive parts. The first part consists of the exploration of possible scenarios for the physical expansion of Maasmere (see figure 3a, steps 1 to 9). The second part consists of the development of the selected expansion scenario through the application of a set of utilisation and investment measures, against a background of a chosen scenario for the development of mobility (see figure 3b, steps 10 to 20).

3.4

In the first part, the future expansion of Maasmere is discussed. The participants are divided into two groups, each with a diverse range of members, in which the most relevant interests are represented. The groups are given the task of creating a 'spatial' scenario for the physical expansion that appeals most to them. A scenario must consist of a map with associated arguments and supporting information. On this map, new residential and work locations as well as the supporting infrastructure are indicated in broad terms. Both groups have a Smartboard (an interactive whiteboard) at their disposal. Sketches made on this can subsequently be stored, edited, compared and presented.

3.5

In the second part, the chosen expansion scenario is further developed, with the emphasis being placed to the necessary modifications to the traffic system. The assignment for the participants, who are reshuffled into new groups, is to compile of set of measures on which the group agrees. The measures are for the short and long term; this distinction in timeframe is emphasised. The fact is that Maasmere is struggling with traffic problems that need a solution right now. However, account must be taken of the effects on mobility that the future physical development of the town will entail. The art lies in taking utilisation measures that increase the capacity of the traffic network in the short term without hindering the development of the necessary long-term investments.

3.6

To arrive at an effective and robust set of measures, it is moreover important that the participants agree on the scenario for the development of mobility in Maasmere. We have based the options on four scenarios that the Central Planning Bureau (CPB) has developed for the Netherlands. Of the four scenarios, two are relevant to the Maasmere situation: Global Competition and European Co-ordination. Prior to the execution of the gaming approach, these two scenarios are incorporated into the Paramics traffic simulation model.

Description of Gaming Approach Route 26

3.7

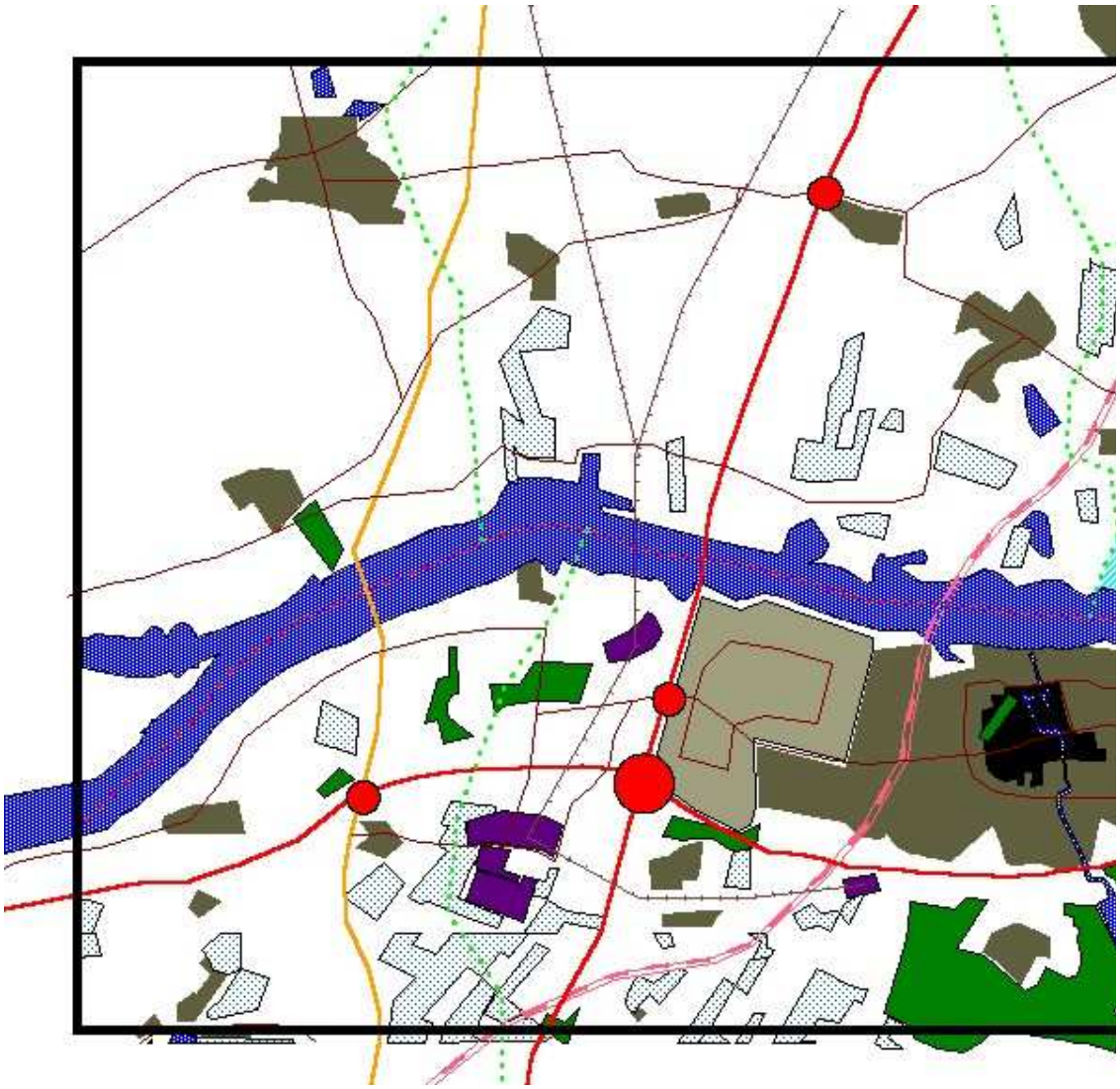
In the description of Gaming Approach Route 26, the previously mentioned elements are reviewed. The knowledge basis of Gaming Approach Route 26 lies in the system analysis[2] carried out for a game simulation designed earlier. The abstracted model that arises from this system analysis is the foundation underpinning the Gaming Approach Route 26.

3.8

The safe environment is created by the design of a fictional town Maasmere that is brought to life as realistically as possible. Maasmere is placed in a credible historical context and has familiar spatial and traffic structures. Its pattern of problems is familiar and urgent: a growing need for space and mobility set against a background of limited possibilities for physical expansion, in which infrastructure requiring space, such as the traffic infrastructure, is hampered.

3.9

Various fictional parties are active in Maasmere. They form the basis for seven game roles within the Gaming Approach: the City Council, the Federation for Habitable Maasmere, the Maasmere Industrial Society, the Road Freight Haulage Association, the Co-operative Association for Person Transport, the regional board of 'Traffic and the Economy' and the regional board of 'Urban and Rural Planning, Nature and the Environment'. The latter are both regional representatives of the ministries of the same name. Depending on the number of participants, the media can be added to the game roles, in the form of the Maasmere Journal. Two additional simulated roles are also involved: the representative of Environmental Planning and Welfare for the Province of South Flevoburg (the governor of the province) and the Minister of Traffic and the Economy. The simulated roles are operated by the game facilitators; they also give assignments to the participants who are engaged in the role-play.



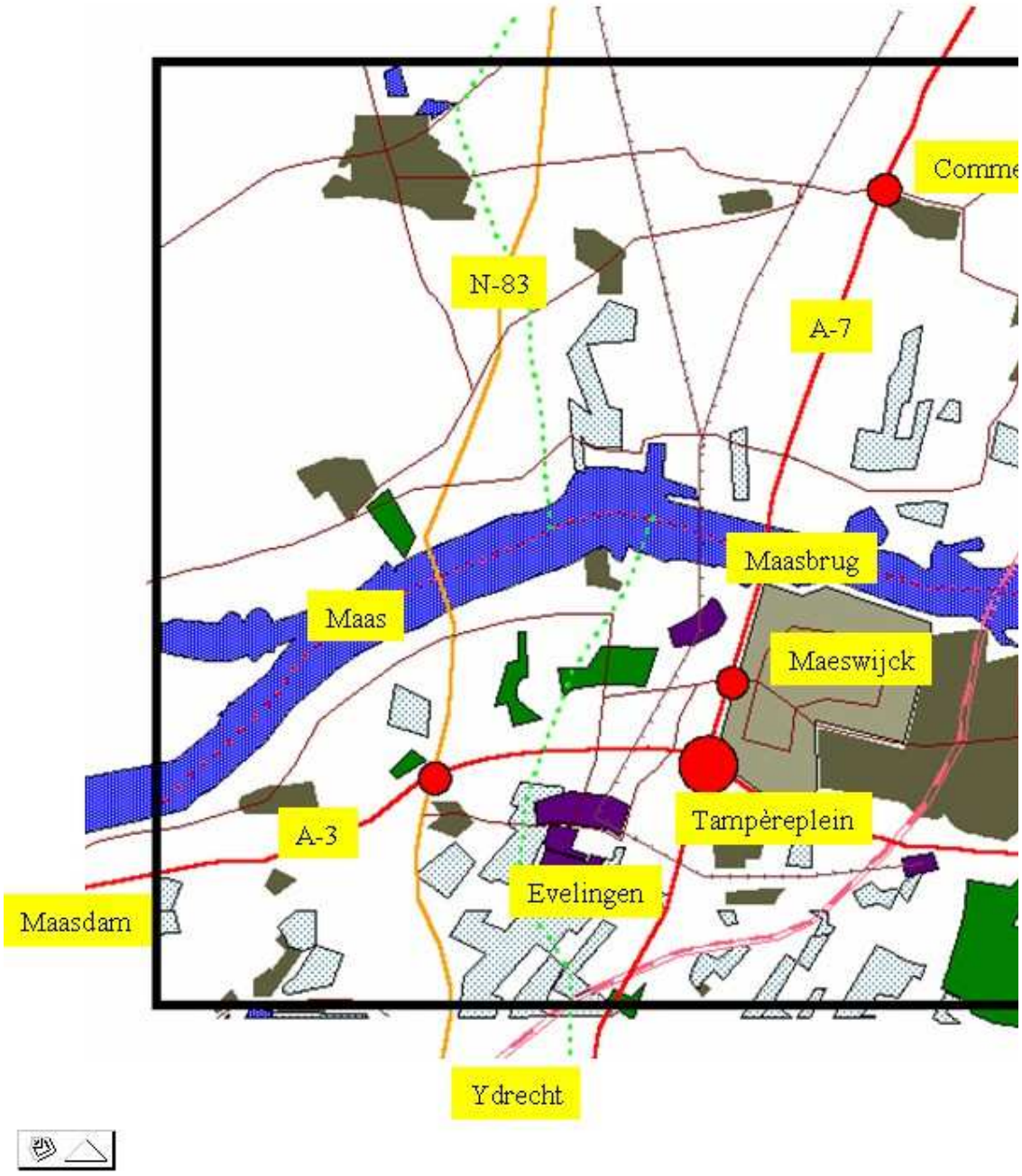


Figure 2. The fictional location of Maasmere

3.10

We have chosen to have each participant play a role that is similar to his or her own job. For example, the participants from the Department of Public Works play the role of 'regional board of Traffic and the Economy' and the participants from the environmental movement play the role of Federation for Habitable Maasmere. In this way, the practical knowledge of these participants is easily incorporated into the simulation. This increases the degree of realism and sharpens the conflicts of interest.

3.11

The policy issues relating to the use of space and traffic comprise an important part of the gaming approach. Maasmere is running out of expansion options. Space for housing and work must be found in order to achieve the desired urban development. Claims on space have also been made for the expansion of the water storage capacity and to reinforce ecological value. The capacity of the transport network in and around Maasmere is increasingly inadequate. Congestion on the main roads is the most visible problem. To be able to guarantee that the demands posed by mobility in the short and long term will be met, there must be investment in the transport network. The installation of new infrastructure will, in turn, take up a large amount of space. The acceptance of this is an important issue in the face of claims by other functions requiring space.

3.12

The figures 3a and 3b show the Steps of Play in Gaming Approach Route 26:

Plan for first part/ day one of Gaming Approach Route 26	
Step	**Activities**
1	Introduction to the gaming approach
2	Orientation in the game role: 1. Read role description, scenario and policy issues; 2. Plenary presentation of the traffic situation.
3	Make 'field of influence'-analysis: → Complete Interest, Influence, Behaviour (IIB forms
4	Two discussion groups for Action Plan (Process focus) Assignment: make an Actic Plan to solve the policy dossier at hand. How are we going to formulate the solutio parties, phasing, etc.
5	Assessment of Action Plan(s) by the participants themselves (scores on the Interest Influence, Behaviour table). Discussion of IIB-scores and feedback by facilitators
6	Break
7	Two discussion groups for an integrated solution (content focus). Assignment: formulate a solution in terms of content for the policy dossier at hand. Use a card o the Smartboard and an information session to do this
8	Presentation of the content solutions by the discussion groups. 'Assessment' of this conducted by the independent expert → Comments on this and discussion with the participants (plenary)
9	Debriefing and conclusion; followed by dinner

Figure 3a. Gaming Approach Route 26: steps of play for the first part

Plan for second part/ day two of Gaming Approach Route 26			
Step	**Activities**		
10	Feedback from the try-out (plenary): • Paramics pictures of the traffic black spots; • The two spatial scenarios (Bridging the Maas and Intensification in the town); • The two mobility scenarios (Global Competition and European Coordination).		
11	Orientation in own role: read role description; setting short and long-term ambitions within the role		
	Participants' groups		
12	*Short-term group*	*Long-term group*	
	• Compile a set of measures starting from a set of possibilities • Formulate input for the long-term group; suggestions for investments	• Choose one of the spatial development scenarios • Formulate a vision of the chosen spatial development • Determine the associated investment strategy and projects (compile an investment package starting from a set of possibilities)	
13	• Feedback on short-term set of measures with the help of Paramics (plenary) • Short debriefing by the facilitators in response to results		
	Short-term group	**Long-term group**	**Process co-ordination**
14	• Compile a new set of measures starting from a set of possibilities • Formulate input for the long-term group; suggestions for investments.	• Adjust (concept) vision given the input by the short-term group and Paramics • Ditto for the Investment strategy and projects (compile a new package of investments)	• Briefing by the game facilitators • Make a concept action plan • Prepare presentation
15	Break		
16	Feedback on short-term set of measures with the help of Paramics (plenary)		
17	Presentation by Process co-ordination (plenary)		
18	Presentation by long-term group: which scenario, which vision and which package of investments?		
19	Feedback on long-term package of investments with the help of Paramics (plenary) Effectiveness of this package in 2020.		
20	Debriefing (plenary)		

Figure 3b. Gaming Approach Route 26: steps of play for the second part

Learning in a game environment: special attention for the feedback structure

3.13

The Gaming Approach Route 26 focuses on two types of learning objective. The first is the search for intrinsic knowledge improvements and innovations for the policy issues presented. As mentioned earlier, Route 26 forms part of the Roads to the Future innovation programme. The second learning objective is to enable the participants to reflect on the way in which the decisions that lead to innovations are taken. They are invited to think of and implement adaptations to the learning process. They do this by making suggestions for improvements for the way in which the decisions in the gaming approach are made.

3.14

It is via these two learning objectives that Gaming Approach Route 26 aims to stimulate both single loop and double loop learning. Owing to the emphasis on learning, attention is paid to the way in which reflection is given on what has been learnt. The reflection is supported by feedback mechanisms. The feedback mechanisms for single loop learning focus on the effects of the measures taken. These effects relate to the traffic situation, the use of space, the financial consequences and the traffic safety situation. Because of the emphasis on traffic measures and their effect on the present and future traffic situation in and around Maasmere, a separate feedback instrument has been designed: the Paramics microscopic traffic simulation model. For feedback on the other themes, a simple calculation module has been developed with which the spatial, financial and safety effects of the selected and implemented (in Paramics) traffic measures can be recorded and fed back.

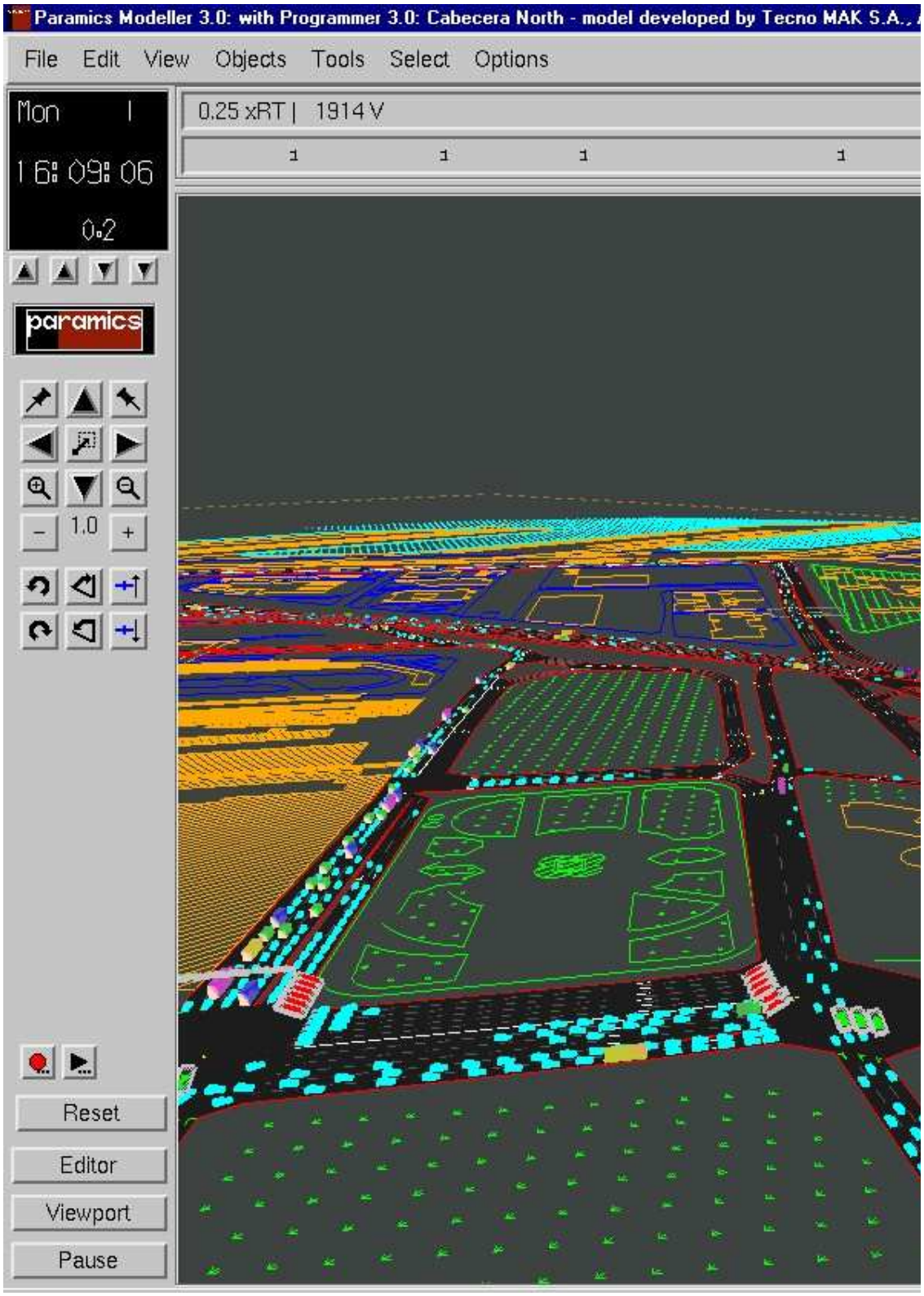


Figure 4. Screen shot of a PARAMICS simulation of urban traffic and motorways

Paramics as feedback instrument

3.15

PARAMICS is a software package that simulates the traffic performance in a network at vehicle level. It takes into account the limitations imposed by the type of road (speed limit, presence of lanes for specific user groups, etc), by the presence of other vehicles in the immediate environment and by traffic management measures such as traffic lights and ramp metering lanes. The type of vehicle and the degree of aggression expressed by the driver influence the driving behaviour. The basic data for the simulation are the road network and a time-dependent traffic demand pattern (O-D table). PARAMICS then determines during the simulation the shortest route to the destination for each vehicle and reconsiders this route at each junction. The current traffic situation, knowledge of the local roads and the presence of route advice in the form of the Dynamic Route Information Panels or on-board route navigation systems help determine the eventual route. Conversely, public transport services can also be simulated; such services typically unfold according to a fixed route and timetable.

3.16

PARAMICS is suitable for both urban and motorway networks. All possible junctions can be simulated: roundabouts, junctions controlled by traffic lights, acceleration and deceleration lanes, etc. Furthermore, the user of the model can also design new junctions, intersections and traffic regulations to meet their requirements. One of the most important uses of PARAMICS is to analyse alternative traffic management strategies. For this purpose, various traffic management measures have been entered into the model. A typical example in the urban road network is the inclusion of lanes for specific users (e.g. a bus lane) and traffic lights. The control strategy can be programmed by the user and can range from a fixed cycle to the most complex dynamic algorithms. Classic examples of measures for motorways are ramp metering, traffic signalling (dynamic speed limits or lane closures) and Dynamic Route Information Panels. Here, too, the user's wishes can be accommodated by programming new measures for particular scenarios.

3.17

The use of Paramics and the impact assessment model make it necessary to define a broad set of possible utilisation and investment options beforehand. Neither model is flexible enough to handle new measures introduced during a group session and calculate their effect on traffic, spatial planning, finance and safety. In a number of exploratory studies carried out prior to the construction of the game, suggestions for measures were generated and assessed for their effectiveness and feasibility[3]

3.18

Double loop learning occupies a special place. It is a question of enabling the participants to discuss the manner in which they learn (single loop) in the game environment and, if so desired, the means to change this. This is included in the gaming approach in two ways. In the first way the initiative lies with the participants themselves: in consultation with the facilitators, they can change the manner in which they have meetings, negotiate and exchange information. In the second way, the initiative lies with the facilitators / game makers: in the second part of the Gaming Approach, a new assignment is introduced in which the aim is to think of a way to achieve a better coherence between short and long-term policy. In this way, the participants give shape to their experiences with the policy-making in the Gaming Approach up to this point: they are challenged to contribute and try out points for improvement for the simulated policy-making process.

3.19

Double loop learning is emphasised by stepping out of the simulation by way of a debriefing. The facilitators reflect with the participants on the experiences and the participants discuss among themselves 'how to take things further' and 'how it goes in practice'. The closing debriefing is rounded off with a drink and followed by dinner so that ideas about the experiences can be exchanged in a more informal atmosphere.

Responses to Gaming Approach Route 26

3.20

Responses to Gaming Approach Route 26 have thus far been predominantly positive. The participants:

- Recognise Maasmere as a representation of the traffic problems at urban and regional level;
- Contribute their experiences, knowledge, emotions and assumptions from their daily work when completing the game assignments. This increases the resemblance of reality and the degree of difficulty of the lessons learned in the Gaming Approach;
- Are stimulated by the feedback structure within the Gaming Approach. The visualisation tool of the Paramics traffic simulation, in particular, appeals to the imagination and spurs the participants into action;
- Are stimulated to make creative scenarios for the future physical development of Maasmere. The 'Smartmap' design tool offers the possibility of discussing the various options with the aid of sketches;
- Actively participate in the debriefings during and following the simulation. Suggestions for improving the Gaming Approach are made, such as emphasising more sharply the tension between the short and long-term pattern of problems.

3.21

The experiences with the Gaming Approach Route 26 show that by means of the experimental setting, the participants are 'seduced' to a constructive, content oriented discussion. The above described feedback structure plays an important role in the seduction and helps the participants to get going. The feedback on the effectiveness of the measures taken sharpens the differences and the similarities among the participants.

3.22

The try out indicates that participants are willing to search for alternative measures because they have experienced that the package which was implemented, turned out to be not as effective as they expected it to be. Thus the are 'playing' with the problem, it's definition and it's alternative solutions. Moreover, they are playing with each other, trying to convince, seduce or team up with other participants in order tot find the most effective package of policy measures.

Conclusions and further development of the Gaming Approach

4.1

On the basis of experiences with the Gaming Approach Route 26 we have reached the following conclusions:

- The chosen gaming approach enables the creation of an environment that according to the participants corresponds strongly with the real situation. This correspondence makes our Gaming Approach suitable for use as an instrument in participatory policy-making, in particular for complex, unstructured, policy problems in our area of specialism;
- An important new element in our Gaming Approach relates to the feedback of the effects of measures taken; traffic-related effects in particular are precisely calculated, but investment costs and effects on the environment and safety are also determined. This rapid and comprehensible feedback of effects feeds the participants' motivation in the form of a structured discussion about possible solutions;
- To break deadlocks, it is usually desirable to be able to create win-win situations (positive non-zero sum). To supplement the Gaming Approach, we therefore propose to develop a toolbox containing starting points (in terms of both content and process) for creating win-win situations (positive non-zero-sum solutions). A preliminary version is already available;
- Experiences with the Gaming Approach Route 26 indicate that the participants focus strongly on short-term solutions. In the improved version of the Gaming Approach, participants are forced to consider the situation in the long term and the short-term measures that this necessitates;
- A gaming approach creates a negotiation situation that can lead to solutions that are acceptable to all parties. To ensure that these solutions are followed up, it is vital that the participants are authorised by the people they represent.
- Guidance has proved a vital success factor in the Gaming Approach. A group of 15 to 20 participants requires a team of at least four facilitators. Roles are allocated beforehand within this team: the host, the game leaders and the independent expert(s). The host is the visible point of contact for the participants and coaches them through the game. The game leaders take care of the game logistics, more or less invisibly, by paying close attention to the time planning, the provision of the necessary materials and the guidance and steering of subgroups and individual participants. The independent expert settles content-related differences of opinion between the participants so that the game stays on track and assesses interim results. In this respect he/she is part of the feedback structure in the Gaming Approach Route 26;
- Gaming Approaches are usually used during the preparations for formal decision-making processes. In a safe environment a complex issue can be explored in terms of both intrinsic knowledge and process. A fictional game environment ensures the necessary safety. The principles of gaming are, however, also useful in making a direct contribution to a decision-making process that is underway, for example by way of a policy experiment (see figure below).

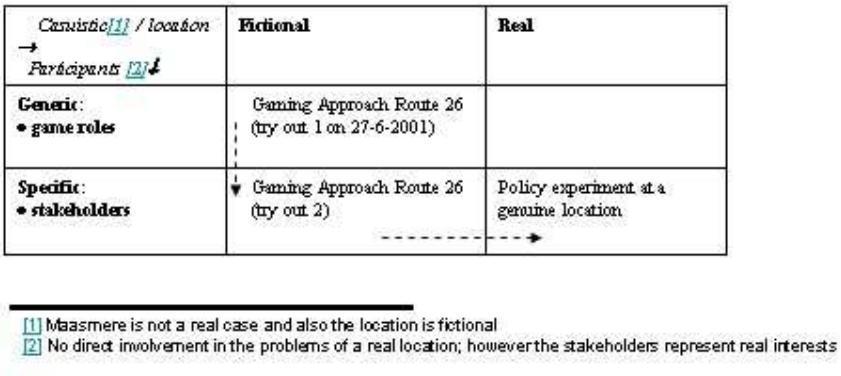


Figure 5. Profile of situations for the application of gaming

4.2

The above conclusions raise the following issues for further development of the Gaming Approach Route 26:

- How can the authorisation of the participants in the gaming approach by the parties that they represent be brought about;
- How can the various interests of the individual citizen be incorporated into the gaming approach; the press currently fulfils this need to some degree;
- As well as the distinction between short and long term, there is also the issue of unequal dynamics in regional and transportation system developments. How can account be taken of this in the gaming approach;
- The main accent in the feedback lies on the traffic effect (logical since problems are traffic-related); nevertheless, a more integrated approach is desirable in which other effects are included, such as effects on the regional economy, quality of life and safety;
- The contents of the toolbox are very important. The contents enable us to think of solutions that can settle disputes between the parties. To facilitate the use of these tools, a framework is currently being developed that is useful in determining where and when the application of a particular tool would be appropriate.

Notes

[1] Problem situations within the domain of TNO Inro (Spatial Development, Traffic and Transportation and Logistics and Distribution) can usually be classed as unstructured problems. Little consensus exists about the values and aims involved and the available facts and knowledge are often one-sided, stemming from just one sector and often forming an inadequate basis for integrated solutions.

[2] We actually used the system analysis as well as the actor-relation model of a former gaming approach, describing the policy making process in the integrated physical and transportation planning field.

[3] See e.g. 'Flexibility in the Environment', TNO Inro 2000, in: Essay bundle 'Flexible Infrastructure', Dutch Ministry of Transport, Public Works and Water Management; 'Bypasses voor bereikbaarheid' (Bypasses to better accessibility), TNO Inro 2000; Description of the traffic situation in Maasmere, TNO Inro 2001).

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Return to Contents of this issue