



Social Sciences

Sustainable Accessibility of the Randstad – Three Years On

Popular Annual Report 2010

Netherlands Organisation for Scientific Research

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Foreword

For the third year running, it is my great pleasure to take you on an excursion through the NWO programme Sustainable Accessibility of the Randstad (SAR). We will be taking a tour of the research teams, now risen to 10 groups, who are working on fundamental and policy-relevant scientific knowledge for the purposes of a sustainably accessible Randstad region. The fact that they are meeting a clear need was amply evident at the successful event held in Utrecht on 8 November 2010, organised by the SAR programme in co-operation with the NICIS Institute. A brief impression of this event is provided in the annual report at hand. You will also be introduced to the three latest programmes to be awarded grants in the context of SAR in 2010. And of course, the other seven research programmes, which have been running for somewhat longer, will also offer a brief update on their work.

The SAR programme was launched in 2008 as an initiative of the then- Minister of Transport, Public Works and Water Management, in co-operation with his counterparts from the ministries responsible at that time for Housing, Spatial Planning and the Environment, and for Economic Affairs. Starting in 2009, the Ministry of Agriculture, Nature and Fishing also provided a financial contribution. Since that time, the ministries have been restructured and are now the Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs, Agriculture and Innovation. The commitment to SAR naturally continues unabated.

Changes have also been taking place at NWO. The new strategy for 2011-2014 identifies Connecting Sustainable Cities as one of the important new themes. It is an important societal theme in the context of the fact that approximately 50% of the total world population currently lives in cities, often situated in vulnerable delta regions. According to predictions by the United Nations, about 70% of the world's (significantly larger) population will live in urban areas by 2050, presenting challenges in areas such as water safety, congestion, spatial cohesion and manageability. The SAR programme makes a solid contribution to the engagement with these challenges.

Siebe Riedstra

Secretary-General, Ministry of Infrastructure and the Environment
Chairman of the SAR Programme Supervisory Board

PS: The popular annual reports for 2008 and 2009, which include a detailed discussion of the seven long-term programmes, are available on the SAR website at www.nwo.nl/dbr.



1 The year 2010 in summary

2010 was the SAR programme's third fully operational year. It was another year of carrying out the research that had received funding, allocating funding to new research programmes, and pursuing and engaging in dialogue with knowledge users.

We'll start by discussing the latter issue, as we the year got off to a good start with a meeting at Delft University of Technology at the beginning of February. The seven longest-running programmes were presented to a small group of 'knowledge users'. Led by Hans Leeflang and Hugo Priemus from the Programme Committee, the meeting was intended as an opportunity to get to know each other better and collectively consider how they might be able to help each other successfully continue to develop and disseminate knowledge in the context of the SAR programme. At the end of the year, in early November, the first larger-scale SAR conference was held in co-operation with NICIS in Utrecht. It started with a morning meeting for the PhD students, and in the afternoon, over 100 researchers and mobility professionals gathered to exchange knowledge. In the evening, a smaller group convened to contemplate new knowledge issues. A brief impression of this day is provided in Chapter 7.

Ten active groups

As far as the actual research concerns, a total of ten consortiums are now operational. The four programmes that were accepted in 2008 are nearly half complete (further description of these four programmes is given in Chapter 6). The three programmes from 2009 are now also off to a good start (for further information, see Chapter 5). Furthermore, three new, slightly shorter programmes were added in 2010, as after the approval round in 2009, it became apparent that there was still some room in the budget to fund several smaller programmes. The Programme Committee chose to make these additions to underline the importance of policy relevance. For instance, the applicants were interviewed regarding the scientific aspects of their proposal and assessed by an internationally appointed assessment committee, and societal relevance and policy relevance were assessed by an ad-hoc policy committee. Funding was approved in September 2010 for three programme proposals for short-term research

that were assessed by *both* committees as excellent or excellent/good. The approved programmes were:

Feasibility and impact of the transition to electric transport

Professor G.P. Wee (Delft University of Technology) in co-operation with VU University Amsterdam and the University of Groningen.

The researchers want to learn the extent to which consumers are prepared to switch to electric transport and how that transition will influence car ownership and car use, and by extension how it will affect the accessibility of the Randstad. The researchers will also study the position of other parties, such as government authorities, the car industry and energy companies. One of the questions addressed is how these stakeholders can be encouraged to collaborate, so they can contribute to the successful introduction of electric vehicles.

Mobility management and climate change

Dr J.N. van Ommeren (VU University Amsterdam) in co-operation with Utrecht University.

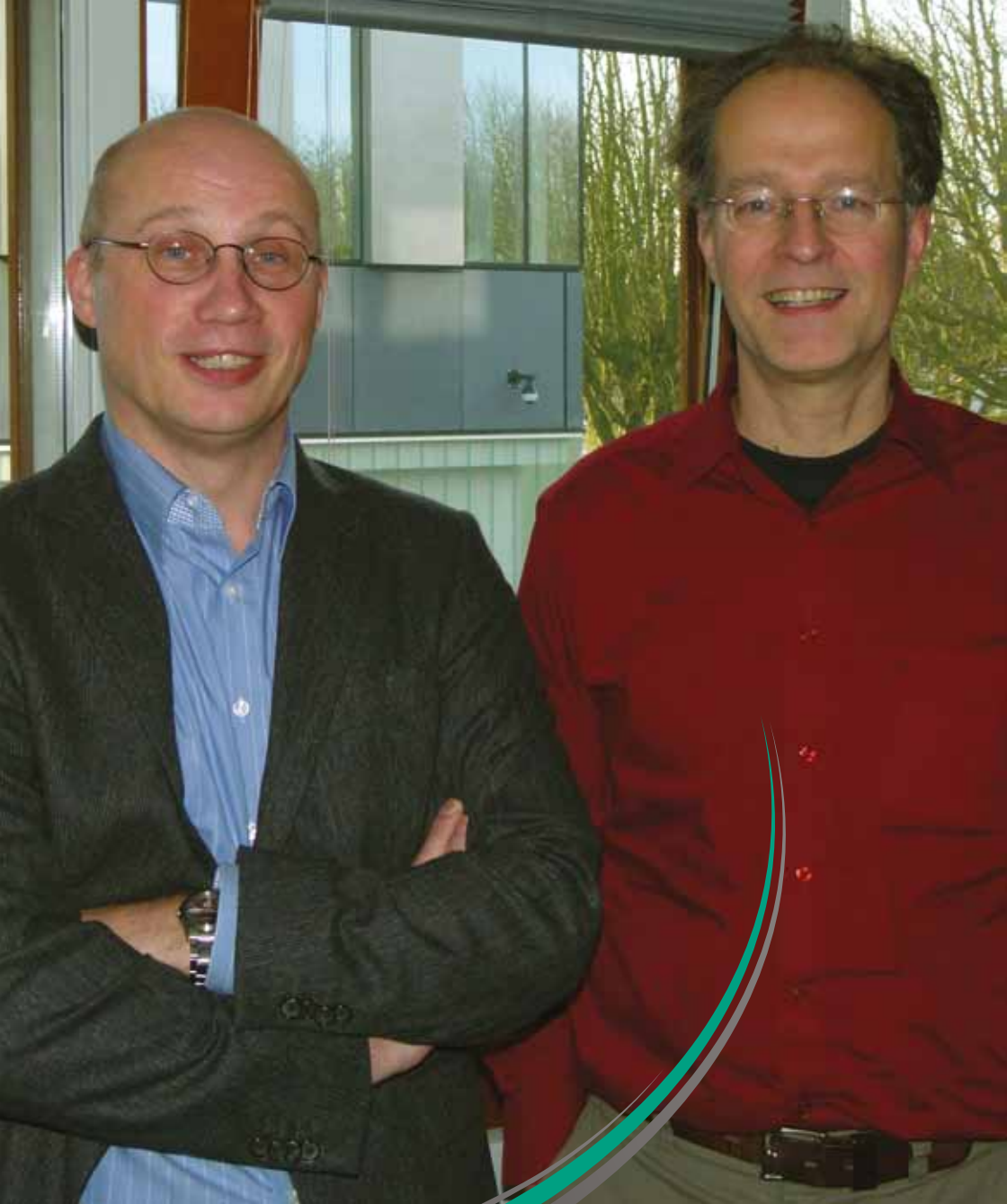
How employers and employees handle mobility issues is vitally important to the accessibility of the Randstad. The researchers will be studying the effect of mobility management by companies, in part in relation to how employees behave in their private lives and to government policy on public transport and spatial planning.

Climate-proof management and maintenance of infrastructure networks

Professor G.P.M.R. Dewulf (University of Twente) in co-operation with Alterra Wageningen University and Research Centre.

What consequences will climate change have infrastructure management and maintenance? The researchers aim to improve decision-making processes in organisations in the Randstad that are responsible for infrastructure management and maintenance. In doing so, the scientists link three fields of research: climate change, infrastructure performance and policy development.

Chapters 2, 3 and 4 offer further information on these three new programmes.



Dr Kees Maat is a senior university lecturer at the same faculty and is affiliated with the OTB Research Institute for Housing, Urban and Mobility Studies.

Professor Bert van Wee is a Professor of Transport Policy in the Faculty of Technology, Policy & Management at Delft University of Technology.

2 Steering towards the electric car

Bert van Wee and Kees Maat are heading two NWO projects which are closely connected, both of which concern the transition from conventional fuel-powered vehicles to electric transport. One is funded by the NWO programme on *Energy transitions* and is about the early adopters of electric transport. The other falls within the scope of the SAR programme and is about the phase that follows: the large-scale introduction of electric transport. The researchers involved work at Delft University of Technology, VU University Amsterdam and the University of Groningen. Both NWO research groups will meet regularly to exchange knowledge and best practices.

The two NWO programmes cover two angles of the same issue, Bert van Wee explains. “We see two classic stages in technological innovations. First you have the pioneers, the early adopters who are eager to try out a new technology. This group is often motivated by entirely different reasons than the majority of consumers who switch later. People who buy an electric car before anyone else may do so because they feel that it suits their green identity or image. This certainly also applies to companies who want to present an image of sustainable business practices. These buyers certainly aren’t going to calculate down to the last cent whether the returns warrant the business expense. In their view, it is far more important that they meet their own standards of sustainability and set a good example. People who are already driving an electric car are probably willing to spend more time, money and effort on it than the average driver who has not yet switched to electric. An extensive network of charging stations has not yet been set up and there are still problems with the battery capacity and the action radius. Early adopters are undaunted by such obstacles, whereas the average consumer probably will not switch until those matters are properly sorted – or at least, that is what we suspect. In the two NWO programmes, we will be figuring out exactly what the situation is.”

Watch out for the grannymobile

Another issue presents a potential complication. “The ‘mass consumer’ that we are targeting in the SAR programme has to think the new technology is sophisticated or sexy before making an actual purchase. The opinions of their peers – their friends, family and colleagues - probably also matter a great deal. I am inevitably reminded of the Daf Variomatic from back in the day. That car had a very clever gearbox. More accurately, it did not have a gearbox at all, but a continuously variable alternative. It was a great technological innovation, as far as that went. But unfortunately, those cars were mainly purchased by old ladies. The Daf was nicknamed the ‘grannymobile’. It was not seen as a particularly fast or clever car. Fortunately, the current electric cars do include some very sporty designs. That’s sure to make a difference in large-scale introduction.”

Combination of policies

The government also has to utilise various policy instruments to promote electric transport, depending on whether the early adopter or the mass consumer is the primary target. “Households and organisations that are willing to invest a great deal in being the first may appreciate relevant financial policies, such as fiscal incentives. Mass introduction of electric transport places different demands on the government. Then you might be talking about intervening in spatial planning, or restructuring the electricity sector. Safety is also an issue. Since the cars are harder to hear, the government may need to impose an automatic warning system to notify pedestrians crossing a road that a car is coming, or something like that. Please note here that it is not only about government policy. Other parties also play an important role.”

Car park as an emergency power supply

In essence, the SAR project raises two main questions. Both are addressed by separate post-doctoral researchers. One question focuses on the consumer: to what extent are consumers willing to switch to electric transport? This raises the issue of how that transition will influence car ownership, car use and therefore the accessibility of the Randstad. The other main question concerns the other parties mentioned before: What position do other parties take, such as government authorities, the automobile industry and

energy companies? And how can these stakeholders be encouraged to collaborate, so they can contribute to the successful introduction of electric vehicles? Van Wee: “What you’ll see is that one side’s views and interests will influence the views and interests of the other side. A good example of how that can work in practice is the recent power outage at De Lichtenberg hospital in my home town of Amersfoort. All the patients were transferred as speedily as possible to other hospitals because the afflicted hospital’s emergency power supply was experiencing problems. Once electric passenger transport is introduced on a large scale, an entirely different scenario could be envisaged for such an incident. Imagine if there were a significant number of electric cars in the vicinity of that hospital. Those vehicles would not only have the technical capacity to store electricity by charging their batteries, but would also be able to supply it. Imagine if a few simple connections were all that would be needed to generate a smart grid linking those parked cars to the hospital...”

More than an academic question

Van Wee continues: “We would research whether it would be conceivable for that type of co-operation to be set up between major electricity consumers such as healthcare institutions, electricity companies and consumers who can supply power from those batteries. What interests and positions play a role here? What would it take to put a concept like that smart grid into practice? Not the technical capabilities, but the political or social factors. Other questions relate to things like parking. What kind of parking policy do you need in cities, at companies and so on? Who is allowed to park where, and for how long? And how do you deal with a shortage of available space? Those early adopters will probably generally have somewhat larger houses and may own a piece of land where they can park their car next to their own private charging station. But if this form of transport is introduced on a large scale, including the older neighbourhoods in major cities, you run into all sorts of spatial and financial problems. What role could corporations play in that context? And are we still considering the electricity needed to power electric transport as a public utility? What consequences will this have for power companies? Not enough research has been done on these issues to date. But a serious demand for relevant knowledge has developed by now. It’s not just a theoretical question. Power companies have been working on this for some time. Major cities like Amsterdam and Rotterdam are now presenting themselves as cutting-edge in this area.”



Dr Jos van Ommeren is an economist working as a senior university lecturer at the Faculty of Economics and Business Administration at VU University Amsterdam.

3 Smart fiscal policy facilitates more sustainable work-home commuting

The two post-doctoral researchers and their supervisors – Jos van Ommeren and Piet Rietveld from VU University Amsterdam and Martin Dijst from Utrecht University – working on the project ‘Mobility Management and Climate Change’ are studying the effect of mobility management by companies, in part in relation to how employees behave in their private lives and to government policy on public transport and spatial planning.

“The idea for this project was conceived by a scientific niche in the market,” Jos van Ommeren relates. “You have researchers who primarily look at traffic, and you have researchers who look at how companies work. But we know very little about how companies affect traffic, for example via their lease cars and parking policies. The tax regime strongly influences what companies do – and don’t do – where transport is concerned. The relationship between the company as an employer and that company’s employees is also affected by fiscal schemes, and this has major consequences. If the government is able to introduce changes in that area, you’ll see the effects on the road. Just consider the fact that 20% of the cars in peak traffic are company cars.”

The government can direct the process relatively easily

How does it work? “Because tax laws are structured in a certain way, people tend to choose a bigger car, drive longer distances, and possibly even buy more than one car per household. We are not sure about the latter point yet, but we are looking into it. Furthermore, 40% of new cars purchased are company cars. It is incredibly strange that these figures have not been included in transport studies until now. Very little attention has been paid to the impact of government policy in this respect. These mechanisms and figures are not just a simple piece of data; they are the result of policy and can also be changed! Suppose I wanted to play dictator for one day and wanted to change something about the situation on the road. I would change the tax laws and in no time I would have efficiently and effectively

caused there to be fewer cars on the road, and fewer large cars. Isn't that unbelievable? Basically, the Dutch system gives you a 30% discount on a nice, big Mercedes," Van Ommeren muses. The policy concerning company cars has caught the eye of policymakers in Brussels. Van Ommeren also regularly travels down to share his insights there.

Parking is often free for no reason

Another switch that you can change with tax laws is parking. "Dutch employers aren't allowed to just give their employees things for free. Except for a parking place! And that easily adds up to 750 euros a year. No taxes are paid for that sum, and many employees do not pay their employers anything for it either. That means that parking places are offered to employees relatively frequently and easily. What would happen if employees had to pay for that parking place themselves?" Van Ommeren explains that such situations cause significant 'loss of wealth'. "In the office market, 9% of spending is allocated to parking spaces. That is a great deal of money, but employees who receive their parking place for free do not value it in terms of money. If they had to cover the costs themselves, they would probably never choose to do so; they would prefer to take public transport to work. I think that a good solution could be that everyone who lives more than 10 kilometres from their workplace and does not have a public transport declaration for the Tax Administration would have to add the land value of the parking place to their income. The effect of this may well be that people would take the car to work less frequently and companies would offer fewer parking places."

Carpooling and public transport are competing modes of transport

The effects of intervening in the parking situation will become apparent in the longer term, according to Van Ommeren's account. "People frequently do not reconsider how they commute between work and home until they change jobs or move house. They may choose different modes of transport, or even move closer to their work. Here at VU University Amsterdam, where I also conducted research, we are seeing a steady rise in public transport users. Older employees still often come by car, but people who have been employed for a shorter period generally take public transport. One mode of transport that has oddly never caught on in the Netherlands is carpooling.

In the USA, about 10% commute to work by carpooling! That disparity is probably due to the differences in public transport between the USA and the Netherlands. In the Netherlands, people who take public transport and the potential target group for carpooling are more or less the same people.”

Impact on households

Van Ommeren summarises the main focus of the economists from VU University Amsterdam and the geographers from Utrecht University in the SAR project. “We want to know more about the effect of travel cost allowances and their fiscal treatment. We also want to know more about the influence of fiscal policy at the household level. The post-doc being supervised by Martin Dijst will primarily focus on that aspect. Then it concerns such issues as the question of what people do with their transport options outside of commuting to and from work. Does the fiscal policy encourage them to drive more or less during weekends and holidays? And we want to know more about parking places at organisations. How does it work if you have people pay for parking, or if you only charge them on peak usage days (Monday, Tuesday and Thursday)? After all, it would be a shame to build car parks that are only full three days a week. So far, we’ve seen that people who live very near their work would rather cycle to work to avoid parking fees of as little as one euro per day.”

At the end of the project, policymakers will know which fiscal switches need to be flipped to influence the use of company cars, and they will know more about fiscal treatment of travel cost allowances. Van Ommeren: “And by then we will also know much more about how we can deal with parking places. That is important not only to the national government, but also to local authorities and employers.”



Dr Geert Dewulf is professor of Planning and Concept Development at the Faculty of Engineering Technology at the University of Twente in Enschede.

4 Climate change makes management and maintenance even more challenging

The two post-docs and their supervisors Geert Dewulf (University of Twente) and Pavel Kabat (Wageningen University and Research Centre) from the project 'Sustainable Maintenance Policy for Infrastructure Networks in the Randstad: A climate change perspective' studies the consequences of climate change for the management and maintenance of the infrastructure. The researchers aim to improve decision-making processes in organisations in the Randstad that are responsible for infrastructure management and maintenance. In doing so, the scientists link three fields of research: climate change, infrastructure performance and policy development.

"Management and maintenance are afterthoughts in the world of civil engineering," Geert Dewulf explains. "For instance, our students consider it much more interesting to do their graduation project on something that has not been started yet, like the second Coen Tunnel, rather than something that already exists. That preference for construction over maintenance is also seen in political decision-making processes. Management and maintenance often does not attract attention until something goes wrong – accidents due to a maintenance backlog, for example. Politicians and private individuals also have a hard time assessing the exact value for money where maintenance is concerned. You yourself might not always know whether the wisest choice is to paint your house this year or wait until next year. You won't realise how urgent it is until you see the wood rot away before your very eyes." The low priority assigned to management and maintenance is unwarranted, Dewulf explains. "It concerns a great deal of money and involves maintaining accessibility. Everyone knows what happens when management and maintenance are not organised effectively: traffic congestion. Climate change, or more accurately, extreme weather conditions present even more challenges in this context. The harsh winters we are currently having create all sorts of problems that demand acute

solutions. This is far from simple for road and rail network operators. Their considerations and decisions are still made inside a sort of black box.”

A decision matrix rife with complexity

Researchers at the University of Twente have been working on decision-making processes involving management and maintenance for some time. However, Dewulf has now initiated contact with the climatologists in Wageningen for the first time. “If you know what effects climate and weather have on infrastructure, what consequences will it have for the decisions you need to take in that area? And how can we make those decision-making processes more effective and more efficient?” Dewulf mentions the example of the choice of materials used on the motorways. “The Directorate of Public Works and Water Management opted for highly porous asphalt concrete, which has had excellent results against noise pollution and in situations with a great deal of water on the road. However, we now also know that highly porous asphalt concrete performs poorly in freezing rain. Spreading salt is not sufficient. Last winter, even reducing speeds to 50 km/h was no longer safe enough: sections of road had to be closed temporarily. Now you can include different considerations. Do we follow the example set by Belgium, which is returning to concrete? It lasts a long time, but causes a great deal of noise. Or do you stick to highly porous asphalt concrete? And if you do, how do you handle freezing rain? And how do you schedule maintenance after harsh winters when the top layer has been damaged? You could close the road down for a longer period once every 20 years and then completely refurbish the entire section in one go. However, you could also take a less stringent approach to shorter sections in shorter time periods. These considerations involve both technical and logistic aspects. Every advantage involves a disadvantage and vice versa. We want to incorporate all of them in a decision matrix.”

Small changes, huge impact

Railways involve different problems, Dewulf continues. “Everyone knows the story of the switches that kept freezing. We want to achieve a more precise understanding of the consequences of climate change and extreme weather in this area as well. Like the situation on the road, the ultimate goal is to comprehend and support the complexity of the decision-making processes.” In addressing the problems on roads and railways, the

researchers will work closely with the network operators. “We are working with the Directorate-General of Public Works and Water Management and with Prorail to look into case histories. We will take a section of road and a section of rail and take a detailed look at how and when interventions take place. We will also look at the past. Our hypothesis is that a minor change in weather conditions, just 1 or 2 degrees colder, may already have a major impact. That difference is not considered sufficiently at this point. The weather fluctuations directly affect accessibility. In the east of the Netherlands, we recently saw flooded tunnels after heavy rainfall. This type of flooding has not happened very often yet in the Randstad, but if it does, it would cause significant damage to the societal infrastructure.

Combining fragmented funds

Another thing we have noted is that decisions are often based on budget constraints. Is the money available or not? Ideally, maintenance planning should be much more rational, but the reality is that many factors and actors play a role, which leads to an unusual dynamic.” Money and responsibilities for management and maintenance are scattered across many different budget categories and stakeholders. There are many links in the supply chain. “If you combine all the different factors, management and maintenance will be a serious factor in mobility policy. Both the Directorate of Public Works and Water Management and Prorail are also considering whether all these aspects could be integrated and combined more effectively. After all, they are held accountable for infrastructure availability,” Dewulf explains.

Caught in the dichotomy of action research

The fact that the SAR project is being carried out by post-doctoral researchers is an advantage, in Dewulf’s opinion. “They can make the connections quickly because they’ve been around for a bit longer. The researchers will also grasp the links to the other SAR projects and to projects from other programmes, because there are clear areas where the projects are related. Another thing that makes this project exceptional is interaction with the network operators. What headaches do these people face on a day-to-day basis? I am a strong proponent of ‘action research’, although it sometimes causes scientists to be caught in the dichotomy between sound science and policy relevance.”



5 Three programmes from the second round are off to a good start

Three new research programmes received funding in 2009 in the context of the SAR programme. In 2010, all the research positions were filled and the teams started working on the substance of the programmes, both individually and in collaboration.

CESAR – climate change, spatial planning and transport behaviour

The first challenge of the CESAR programme, led by Martin Dijst (Utrecht University), is to decipher the complex relationships between urban buildings and infrastructure, meteorological processes and behavioural patterns with regard to mobility, residential choices and car ownership. CESAR will then integrate the knowledge into the *Urban Strategy* planning support system to offset the requirements imposed by the climate, bringing them into balance with other interests in the Randstad area. In CESAR, a user panel is being established of representatives from the province of Utrecht, the Dutch Cyclists' Union, the Haaglanden metropolitan area, the Rotterdam metropolitan area and the municipality of Amsterdam.

Interactions between weather, travel and space

PhD researcher Lars Böcker (Utrecht University) has conducted desk research on the significance of weather conditions for travel behaviour. "I included aspects related to methodology, geography and behaviour. I worked closely with Marco te Brömmelstoet from project 2 and researched the interaction between the urban climate and characteristics of the built environment," Böcker says. The output of this project provides important input for project 4. PhD researcher Natalie Theeuwes (Wageningen University and Research Centre) also conducted desk research and set up a model. Her contribution involves weather research and forecasting, allowing her to see connections between spatial planning factors (road width, building height, albedo, heat

capacity, anthropogenic heat etc.) and meteorological factors (temperature, humidity, wind etc.). She performed an initial evaluation of the model. The output from this project will be integrated into project 4.

Preparing for experiments

Researcher Marco te Brömmelstoet (University of Amsterdam) wants to improve the relationship between tacit knowledge and explicit knowledge in strategic urban planning in relation to the themes of microclimate, mobility and urban development. The theoretical framework that will be used to assess the results of the experiments is currently in development. The researcher describes the current status: “The aim is to be able to connect the results of all the experiments. We have also discussed using *Urban Strategy* in the experiments. The first experiment will be conducted in the coming three months. The factors measured in an experiment like this include assessing how decision-making processes are affected by providing scientific information. It is an experiment because there is only one variable (e.g. providing knowledge) and other factors that might influence the result are carefully controlled.”

The knowledge from the other three projects converges in project 4, which is being conducted by PhD researcher Niels van der Vaart (Utrecht University). The project is still being set up, and the exact research question has not been finalised yet.

Close contact with end users

One of the most important aims of CESAR is to adapt the *Urban Strategy* planning support system in such a way that it can be used to facilitate sustainability accessibility of the Randstad in changing climate conditions. The findings from projects 1 and 2 will be published in a paper, taking into account the current knowledge on how the influence of temperature, precipitation and wind – and their relation to attributes of the built environment – affects movement behaviour. The results will also be presented to current and potential end users. The research team has already received useful feedback from its interaction with the members of the user panel. “The time horizon is different, however,” Martin Dijkstra notes. “CESAR looks at the coming twenty to thirty years, while the end users are more

interested in the short-term results, which can easily be incorporated into current short-term policy. The aim is to organise a meeting with the user panel in 2011, after the first workshop (in February), to show them the relevance of developing knowledge and tools for long-term planning.”

i-PriSM – innovative pricing policy

This research project, led by Erik Verhoef (VU University Amsterdam), looks at innovative pricing systems that could contribute to more sustainable transport systems. The project reviews various modes of transport (road transport, public transport), various technologies (vehicles that run on electric versus conventional fuel), and various relevant groups (travelers and key stakeholders), as well as studying the interaction between infrastructure and urban networks. The implementation and transition phase is expressly included in the considerations. A user panel set up for the project includes representatives from the Ministry of Infrastructure and the Environment, the municipality of Amsterdam, the Haaglanden metropolitan area, the Arnhem-Nijmegen urban region and NS Dutch Railways.

Second-best policy and implementation problems

Researchers Jasper Knockaert (post-doc) and Jonathan Verheul (PhD researcher), both working at VU University Amsterdam, are studying the interaction between spatial planning in cities, urban job markets, traffic congestion and toll roads. “We are developing a theoretical model that focuses on analysing ‘second-best’ policy, a topic that will also play a prominent role in future studies on pricing on monomodal and multimodal networks. We are now ready to conduct the analyses needed to understand the design and effects of second-best pricing policy in an urban spatial structure”, the researchers explain. They will primarily look at problems that could arise in the event of gradual introduction of pricing policy (specifically second-best policy) in the transport systems across time, space, networks, modes of transport and multiple private and public stakeholders. “These are precisely the problems that knowledge users encounter in practice. The connections we make to future research on acceptance of this policy will increase the policy relevance of this research project even further.”

Stakeholders are up to bat

PhD researcher Ozg l Ardic (Delft University of Technology) is still starting her project. “My research will identify the key factors that affect stakeholder acceptance of forms of pricing policy. Since 1988, there have been plans in the Netherlands for road pricing, toll roads, peak traffic stickers, mobile miles and kilometre pricing, but each plan ran aground due to lack of support from stakeholders. Consequently, the project is very relevant to policy, since it may suggest a form of pricing policy that is politically acceptable and also effectively fights traffic congestion.” Among other things, Ardic aims to discover which factors determine the position that key stakeholders take. For example, what defines the position of other stakeholders? What forms of pricing policy are most appealing to them? What is the significance of external factors, such as technological developments in payment systems, the development of pricing policy in neighbouring countries, or the increase in electric cars? In addition to writing papers for scientific journals, she will also write articles for magazines on policy issues. Stakeholders such as politicians, civil servants and interest groups will be involved in the research through interviews, surveys, and possibly also workshops (e.g. Group Decision Rooms).

The psychology behind acceptance

Post-doc Jan Willem Bolderdijk (University of Groningen) already has experience in studying social acceptance of mobility policy and will be helping to co-ordinate the field research. Bolderdijk: “My research is about the relevant psychological mechanisms that determine the actual effectiveness and acceptability of pricing policy. This could include whether a policy is seen as fair and the ways in which the policy is communicated.” Among other activities, Bolderdijk will conduct a number of lab experiments to test relevant psychological principles. There will also be a survey of automobile drivers, public transport users and stakeholders (lobby groups). The specific contents of the research project will be defined in consultation with the PhD researchers working on the project. They will also be working with experts from Norway (Peter Kallbekken, CICERO, Center for International Climate and Environmental Research, Oslo) and Sweden (Dirk van Amelsfort (WSP Sweden)).

Human responses to pricing policy in a simulated transport network

PhD researcher Erik-Sander Smits (Delft University of Technology) wants to be able to determine the traffic and welfare impact of various innovative toll systems on the environment. To that end, he has developed a theoretical framework, which he presented at the TRAIL conference in November 2010. "Behavioural responses to pricing policy are set out in this framework, simulating travel on a multimodal transport network. The framework will be flexible enough to provide insight into the effects of a highly diverse range of pricing measures in the Randstad", Smits explains. Moreover, the research will culminate in a tool that supports decision-making processes. He is developing the multimodal network model in close co-operation with the researchers from the SRMT programme in SAR.

SRMT – Strategy towards sustainable and reliable multimodal transport in the Randstad

The researchers working on SRMT are developing coherent strategies for the Randstad based on an integral scientific approach to land use, location selection and multimodal transport networks, travel behaviour and transport policy. The programme is led by Ingo Hansen (Delft University of Technology). The envisaged research results will be relevant to sustainable mobility policy in relation to investments in the strategic transport network and Infrastructure, Space and Transport Multi-year Programme (MIRT) projects. A user panel set up for the project includes representatives from the Amsterdam metropolitan area, the Ministry of Infrastructure and the Environment, Prorail, the Haaglanden metropolitan area, the NS Dutch Railways, Bouwfonds and the RET Rotterdam Transport Company. Various user panels will actively contribute to the research, e.g. by providing data.

Proximity of stations increases productivity

PhD researcher Yuval Kantor (VU University Amsterdam) is still starting his project. He has explored various lines of research, including consumer preferences and the use of multimodal transport systems (for example, how habitual behaviour affects transport choice) and the consequences of multimodal transport on urban development and spatial planning (for example, how station density affects productivity). "I have particularly worked on the

latter area using a rich data set and statistical methods that have apparently never been used before in this context. The preliminary results indicate that companies achieve a significant increase in productivity in close proximity to train stations (up to 3km), and that these profits drop as the distance to the station increases,” Kantor explains.

Why urban developments happen the way they do

PhD researcher Andrew Switzer (University of Amsterdam) is working on development and application of theory to actual challenges to mobility within the Randstad. Switzer: “The focus is on combining theories that are the basis of sociotechnical transition studies and research on urban mobility planning. Integration of these theories should provide a better understanding of why certain developments in urban mobility happened and why it has proven so difficult to integrate different modes of transport and to integrate transport and spatial planning, as policymakers have tried to do. I have a sparring partner from the province of North Holland to help me in my analysis.” Switzer presented a paper at the CVS 2010 conference; the feedback he received from other researchers and practical experts will help him fine-tune his work.

Optimising transport networks

PhD researchers Ties Brands and Anthony Ohazulike both work at the University of Twente and are developing a method to optimise transport network design. They will also be using the TRANSFER multimodal network model developed by TNO. Their model optimises various network alternatives on two levels to serve various purposes (such as accessibility, sustainability and efficiency). The first level involves co-ordination between the transport supply (junctions, connections, capacities) and the expected transport volumes, while the second level allocates the transport flows in the multimodal networks and tests how robust the solutions are. Examples of possible network scenarios that could be tested include large-scale Bike & Ride facilities, attractive Park & Ride facilities, high-frequency public transport services, new stations and regional rail lines.

A dynamic multimodal assessment model

PhD researcher Gijsbert van Eck (Delft University of Technology) conducted a thorough analysis of the requirements that his dynamic multimodal assessment model needs to fulfil. Through desk research, he determined how these requirements can be met and what challenges need to be resolved. “On the basis of these two analyses, I developed a conceptual framework for the assessment model and a detailed research plan. I am working with other researchers in SRMT and i-PRISM”, Van Eck states. “We working on the programming environment for developing the model, and we wrote a paper on the optimal design for the urban public transport network for the CVS conference. In collaboration with my colleagues from project 3, I wrote a paper on multimodal network design and assessment for the TRAIL conference in 2010.”

Synchronising public transport timetables

PhD researcher Daniel Sparing (Delft University of Technology) wants to build a multimodal database of co-ordinated variations on public transport timetables in order to determine the capacity utilisation of lines, lanes, modes of transport, stations and transfer hubs, and to assess how stable and robust the transport services are. His research will focus on three cases: synchronisation of the timetables between different modes of transport, the influence of the new light rail connections and alternative scheduled bus services on the stability and reliability of the networks, and the increase in train frequency on the rail network. Sparing has developed an optimisation method for synchronising a low-frequency bus system with a transfer hub for bus-to-bus and multimodal bus-train and train-bus transfers and assessed the impact of night bus services synchronised more effectively to the arrival and departure times of the night trains at Amsterdam Central Station.



6 Four programmes from the first round are nearly half complete

The first four research programmes received funding in 2008 in the context of the SAR programme. At the end of 2010, these four programmes were nearly halfway through their allotted time. How are they doing? The teams present the highlights in the following section.

Sustainable freight transport

The researchers working on 'Towards a sustainable multimodal freight transport system for the Randstad', the programme led by Lori Tavasszy (Delft University of Technology and TNO), focused on the significant increase in freight transport in and around the three main transport hubs in the Randstad (the ports and Schiphol Airport). They are researching production, consumption, trade and supply chains and considering such topics as the concept of transshipment terminals and the issue of urban distribution. Various experts are involved in Tavasszy's freight transport programme, including people from the Knowledge Institute for Mobility Policy (KIM), Statistics Netherlands (CBS), TNO and the Rotterdam Port Authority.

Data collection presents a challenge

One of the major challenges for the researchers on Tavasszy's team is data collection. Post-doctoral researcher Maureen Lankhuizen (VU University Amsterdam) is working on this issue. "Developing quantitative information about national and international freight flows at the regional level is a complicated process that involves integrating different data sources. We discussed our methodology for this process with experts from Statistics Netherlands and the Knowledge Institute for Mobility Policy," Lankhuizen explains. To integrate the data, the trade statistics have to be converted into (gross) weight. Lankhuizen improved the method used to derive the weight conversions for the trade statistics.

Policy support tool in the making

Igor Davydenko (PhD research at Delft University of Technology), who is working closely with Maureen Lankhuizen, is also extremely dependent on accurate data. “The statistics available to the public are not sufficient to categorise freight flows into production, distribution and consumption. But that is necessary for my models. We currently have a special contract with Statistics Netherlands that makes it possible,” Davydenko says. He is developing a model to use these data to learn more about the logistic preferences of companies who filled out these surveys. To prepare, he collaborated on a review paper on the logistic component in freight transport models. His fellow PhD researcher Mo Zhang (Delft University of Technology) is developing a policy support tool for designing transport networks, which combines economic and environmental information. She drafted two papers in 2010: a description of the technological status of freight transport optimisation models and a report on the results of the intermodal network evaluation of MSc student Martijn van Driest, whose Master’s thesis was on this topic.

Multi-actor system in urban logistics

PhD researcher Nilesch Anand (also from Delft University of Technology) took stock of the challenges related to the development of a multi-actor system for urban logistics. He presented a paper on the topic in Canada at the Transportation Research Forum 2010. To understand the strengths and weaknesses of the current models, he conducted a thorough study of attempts to create urban distribution models. “The results will be useful in specifying the features of the urban logistics model that we want to make,” Anand says. He is working on a paper for the Transportation Research Board 2011 in Washington DC. He also organised a workshop on modelling urban distribution, including contributions from experts from the Netherlands and abroad.

The effect of geographic distance

The research group is also conducting empiric research on the effect of different dimensions of ‘distance’ on trade and transport. They are incorporating cultural, institutional and geographic aspects in their research, making it possible to determine the net effect of geographic distance. The

researchers are adapting their results to the intraregional and interregional freight flows in the Netherlands. The analysis of data from Statistics Netherlands has revealed new statistical material that is relevant to logistics in the Netherlands. Analysis has also demonstrated the differences in freight transport elasticity for each segment of the logistics chain. This may be important for transport policy and provides input for the Dutch road map for freight transport models.

Better technology makes freight transport cleaner than CO₂ tax

Network modelling by graduating Master's student Martijn van Driest has resulted in a network model for multimodal freight transport in the Netherlands. The model has been used to analyse the effects of a CO₂ tax on transport over inland waterways and roads. PhD researcher Mo Zhang concluded that the impact of a higher CO₂ tax on emissions in the freight network is limited and that technological innovations, such as the use of bio-fuels, reduce emissions much more effectively. The multimodal analysis did reveal clear and demonstrable spatial distribution effects of increasing the CO₂ tax; it is possible to show which terminals would profit and which would lose out in that scenario.

Super networks of activities, space and time

The researchers working on 'Synchronizing Networks' are developing a super network in which transport systems, spatial planning and activity patterns are viewed as an interrelated whole in in time, space and 'virtual space'. That way, designers and planners of spatial facilities, mobility and infrastructure can acquire a better understanding of travel patterns.

A user panel formed for the research project comprises knowledge users from the 9292 transport information service, the NS Dutch Railways, the Knowledge Institute for Mobility Policy and the Ministry of Infrastructure and the Environment.

Super model under construction

PhD researcher Feixiong Liao (Eindhoven University of Technology) developed the 'super network model' further in 2010. He developed a method of generating personalised super networks, i.e. networks that are tailored to specific activity programmes of individuals. He also expanded the model to

include the representation of ICT-based activities (e.g. telecommuting and teleshopping) and multitasking (e.g. activities people do while they travel). The model was also expanded to include individuals collectively participating in activities. Liao developed a case study to test the various aspects of the model. He also worked with the researchers involved at Delft University of Technology to prepare for the planned data collection in 2011.

After putting the finishing touches to his research proposal, PhD researcher Chao Chen (Delft University of Technology) started his research in 2010 with a desk study on how travellers take decisions. He is currently writing a paper on that study for a scientific journal. Chen also developed a model to determine the effect of time pressure and task complexity on traveller decision-making processes. He is currently preparing a lab experiment that will be used to gauge the parameters of the model.

Multi-actor decision-making on transport hub development

PhD researcher Sara Levy (Radboud University Nijmegen) first worked out the details of her research plan in 2010. “I will primarily be addressing integration between transport and land use by means of transport hub development,” Levy explains. She will develop a model for multi-actor decision-making regarding the location of office buildings. This model will be used to test the effectiveness of different governance strategies for sustainable land use and sustainable transport patterns. At a later stage, a role-playing game will be developed in which planners will be invited to make choices to determine the location of specific activities. The results of the game will yield useful insights for building a model.

Synchronisation strategies

The post-doc project by Wendy Bothe (Delft University of Technology) started halfway through 2010. She has started preparing a categorisation structure for synchronisation strategies. She also organised a Group Decision Room session at the SAR/NICIS conference on 8 November (see text box). “Researchers and practical knowledge users took part in the session. The aim was to have a fairly open brainstorming session on synchronisation strategies and categorise the strategies according to their impact on improving accessibility. There will still be a second session with a more

predefined structure,” Bothe states. Bothe has also started preparing the questionnaire for data collection in collaboration with the researchers from project 1.

Brainstorming provides good suggestions for synchronisation

According to the people who took part in the Group Decision Room session on 8 November 2010, the following list comprises the top 10 relevant ideas for further research:

1. Electric bicycle for medium-range distances
2. Further development of existing public transport hubs until the location value is ‘full’
3. Use of bicycles on medium-range distances to increase system flexibility
4. Transfer City: seamless transfers from all modes of transport to train
5. Reduce speed in the system, leading to decrease in movement length and increase in activity density
6. Focus on households that have a hard time carrying out day-to-day activity pattern
7. Randstad metro with profitable facilities that could contribute to combined trips: banks, shops, cinemas, restaurants
8. Invest in bicycle quality. Attractive, uninterrupted, clearly marked fast routes
9. Availability in time, especially for recreational functions that generate a great deal of traffic
10. Integral regional development

In relation to increasing bicycle use, the comments noted that the Dutch climate presents a major obstacle, that extra infrastructure will be needed quickly in order to achieve more, and that bicycle parking continues to be an issue that requires attention. The electric bicycle still suffers from an image problem at this point; it may attract more people away from ‘traditional’ bicycles than from cars. Further development of public transport hubs may present logistic problems: many transport hubs are in the centre of a city and are difficult to supply. Lowering the speed of the system will probably lead to initial deterioration in accessibility. A focus on parties who are truly interested in co-operation was noted as a precondition for successful integral planning. It should be noted that not all ideas on this list fit within the framework of network synchronisation.

TRISTAM – traveller response and information service technology

The TRISTAM project researches how travellers use travel information such as travel time estimates when there is traffic congestion. In this context, the researchers are making full use of advancing ICT technology to avoid undesirable side effects of travel information, such as merely shifting congestion elsewhere.

Travel behaviour of colleagues as a pilot

PhD researcher Giselle de Moraes Ramos (Delft University of Technology) spent 2010 exploring ways to collect data on the routes that people choose based on different types of information that they receive. “To that end, I conducted a pilot by tracking the travel behaviour of five colleagues through GPS. Since then, I have developed a tool to automatically process the GPS data and analyse the quality of the data that has been collected,” she says. Since the results of the pilot were promising, she added new aspects to the data collection experiment. Various types of information are provided to travellers, both before their trip and during their trip. Three different combinations of starting point and destination were assessed, looking at distance and route features. Finally, De Moraes Ramos started developing the conceptual basis for the behavioural model on route choice.

Changes in route and destination in response to information

PhD researcher Ruihua Zack Lu (also from Delft University of Technology) studied various model-based approaches to determine the impact of ICT on accessibility. He will be using a restricted multinomial logit model. In any case, the results will be used to design the lab experiment. Lu was able to present his paper on ‘Modeling accessibility in the ICT age’ in a plenary session of the biannual TRAIL conference in November 2010.

The aim of the research being done by PhD researcher Zarah Parveneh (Eindhoven University of Technology) is to determine the effects of advanced ICT on dynamic travel patterns (related to specific activities). “I would like to try to model possible shifts in timing and especially in the location of activities and travel, which arise in response to information and new forms of ICT. I will be looking the consequences that those shifts may have on location patterns and performance of urban and transport facilities,” Parveneh

explains. She will be focusing specifically on dynamic, personalised advice, using descriptive information as a benchmark. The point of departure for the model is that the daily choice of route and destination are the most important elements that can change in response to travel information.

Listen to the radio!

PhD researcher Sergejs Gubins (VU University Amsterdam) primarily spent 2010 working on the development of a theoretical model that determines how telecommuting influences congestion in morning traffic. He is combining a standard bottleneck model of traffic congestion with an activity-based framework. This makes it possible to identify changes in congestion patterns as a result of the increased advantage that travellers enjoy when they work from home. Gubins: "I am also looking at options for empirically determining the demand for traffic information. One way could be to ask people about how much they value various features of information, for example accuracy, time horizon, acquisition time, the necessary search strategy, etc. Another method would be observation of traffic information on the radio. A radio station broadcasts traffic information to attract a broader audience and earn a profit through advertising revenues. By observing the actual delivery of traffic information (in minutes) and gaining familiarity with the structure of the radio market, it will become possible to identify the underlying demand for traffic information that radio stations are trying to meet. This approach is innovative, although it is not yet clear whether it will be feasible. The theoretical model to support it still needs to be developed." Gubins also completed and presented an initial paper (in Spain and Portugal); it was published by the Tinbergen Institute under the title 'Welfare effects of road pricing and traffic information under alternative ownership regimes' and has been submitted to an international publication.

The paradox of declining congestion Sergejs Gubins

researched what people are willing to pay for telecommuting technologies. Their willingness to pay depends on the number of automobile drivers that use the technology. Suppose everyone worked from home. Traffic congestion would disappear entirely. But that would reduce the advantage of telecommuting for individual drivers in relation to severe traffic congestion. After all, the road is emptier and telecommuting becomes less necessary; people are therefore willing to pay a proportionately lower amount to make it possible. The telecommuting concept creates internal conflict at a certain point.

Recreational transport behaviour

The researchers working on 'The value of recreation' are seeking to gain more insight into the needs and choices of travellers concerning recreation and mobility, both now and in the future. In this context, they take account of radically changing conditions, such as the rising demand for recreation, and the consequences of climate change and climate change policy. The user panel for the programme includes representatives from the Ministry of Infrastructure and the Environment and the Knowledge Centre for Recreation Policy. They may be joined by experts from the Knowledge Centre for Mobility Policy, the Ministry of Economic Affairs, Agriculture and Innovation, Alterra, the Forestry Service (Staatsbosbeheer), STIRR and Recron. The panel is still looking for an international expert in the field of transport trends, especially unconventional ones. Bert van Wee (Delft University of Technology) is leading the programme.

The economic value of recreational areas

PhD researcher Tom Gosens (VU University Amsterdam) looked at how it might be possible to determine the economic value of recreational areas in urban regions. He created a database of the range of recreational facilities in municipalities and used the data set for the ongoing recreation survey (CVTO) from 2006 and 2007. Gosens is currently preparing his own data set for more detailed analyses.

Transport options influence the choice of destination

PhD researcher Anna Grigolon (Eindhoven University of Technology) is working on the recreational behaviour of young people, making a distinction between long and short holidays and short trips. Grigolon: “The factors I am looking at here include the influence of low-budget airlines on the travel behaviour of young people, using data I collected myself in a stated choice experiment. How do young adults combine destination, mode of transport, duration, travel companions and accommodations when they are planning their holidays? And what is the role and significance of low-budget airlines in this context?” Research shows that the choices that young people make seem to be motivated primarily by modes of transport. Low-budget airlines and overall cost considerations play an important role in their decisions.

International campaign

Sander van Cranenburgh (Delft University of Technology) is relatively new to the programme. In 2010, he was still working on his research proposal and the accompanying plan. This phase included desk research and the development of a theoretical model for travel demand. This model should make it possible to calculate the influence of structural changes. “My study of the relevant literature shows that hardly any research has been done on mobility behaviour in trend-breaking conditions. Publications that address this issue are primarily speculative in nature. These ‘backcasting studies’ imagine what behaviour might be like under such conditions, and this assumed behaviour is not based on research. Still, sudden changes that break a trend are quite possible. Possibilities include running out of oil or having access to a less stable supply of oil, much high oil prices, stringent climate policy, or technological breakthroughs. Looking at historic research, we see that significant changes have occurred in the transport system over a period of 100 years, often taking significantly less time, leading to major changes in travel behaviour,” Van Cranenburgh states.

The research group organised a special session at the World Conference on Transport Research (WCTR) in Lisbon in July 2010. The researchers from Eindhoven University of Technology and VU University Amsterdam presented a paper; Bert van Wee presented a complete overview of the project and chaired the session.

The supply of recreation drives the demand for recreation

Tom Gosens discovered that an increasing supply of recreational facilities results in increased participation in leisure activities. He also noted that municipalities that have fewer facilities display a shift from leisure activities outside the home to leisure activities inside the home, rather than shifting to other activities outside the home. His study also showed that the amount of money spent per recreational activity does not differ significantly from one individual to another. Since this also applies to ‘green’ recreation, it is conceivable that the economic value of this type of leisure spending may be higher than had initially been expected.



7 Successful three-part conference in November

Researchers and experts with practical experience in urban areas have a great deal to offer each other.

Science, policy and practice could even be said to form a ‘love triangle’, one speaker argued at the ‘Sustainable accessibility of urban regions’ conference on 8 November in Utrecht. And it did turn into something beautiful, there in that conference complex appropriately named ‘In the Triangle’. Practice-based experts from the major cities of the Netherlands helped researchers stay focused on pragmatic issues of everyday life; scientists had the chance to answer urgent questions on the spot. The conference also left room to cover issues that have not received enough attention yet: What can we achieve with bicycles? How does it work in other parts of Europe? How can we achieve sustainable accessibility with fewer resources?

Deliberately or coincidentally, the day was also structured in three parts. In the morning, the PhD and post-doctoral researchers from the SAR programme met with each other. The plenary session in the afternoon was for researchers and knowledge users, followed by a smaller group that spent the early evening brainstorming about future research questions.

Show me your object and I'll know who you are

After the event was opened by the programme committee chairman Hans Leeflang (Ministry of Infrastructure and the Environment), various PhD researchers offered an explanation of the objects they had brought along. Football fan Chao Chen (originally from China) showed a Manchester United football jersey. His research is about the choices that people make in their activity patterns. Ruihua Zack Lu had a webcam with him; that's how he stays in touch with his friends and family in China. Since he is studying ways to use ICT to address mobility problems, it was also very relevant to his research. Tom Gosens help up a ticket to a Prince concert that evening in Antwerp. Although his research focuses on recreation close to home, his trip across the Belgian border made him an exception. Nilesch Anand from India

showed a traditional wooden mask; he is studying the behaviour of different actors related to freight transport, which often involves looking ‘behind their masks’. Niels van der Vaart had a sort of Rubik’s Cube with him; if you turn one side, it also affects the other sides – a typical example of what researchers encounter in complex problems (climate change, behaviour, spatial processes). Erik-Sander Smits had a book on game theory with him; life is often a game, especially where pricing policy is concerned. Daniël Sparing (who studied in Hungary and France) held up a tiny model locomotive, postulating that public transport is the driving force behind regional development.

Linking effective networks is half the battle

Jeroen Haver, mobility policymaker with the Ministry of Infrastructure and the Environment, then spoke to the audience about “big cities, big problems and big opportunities”. He used the metaphor of the love triangle: science, policy and actual practice have to work together to achieve the best result. Seven representatives from the seven longer-term programmes were then invited to spend a maximum of seven minutes to say something about the research programmes. Then there was a short, practical brainstorming session to consider how researchers can keep in touch in the coming time, for example to facilitate joint use of data sets that are purchased or collected. The researchers decided to set up a LinkedIn group and a mailing list (both of which are already operational) in line with the concept of sustainable mobility through telecommuting. They agree to share important steps in their research so everyone’s experiences could be used to maximum effect.

Science has to identify what really works

The afternoon session was attended by over 100 people from large cities, regional partnerships, provincial governments, public transport companies and other relevant businesses, universities, consulting firms, other knowledge institutes and NGOs. Hans Leeftang and Wim Hafkamp (scientific director of NICIS) co-chaired the afternoon session. The plenary session opened with an interview with the Utrecht alderman for traffic and transport, Frits Lintmeijer. Utrecht is an excellent example of a large city with various accessibility problems and solutions, and Lintmeijer rattled off a number of

specific examples. In passing, he offered a number of useful suggestions to the researchers:

- Take an integral look at different modes of transport; for example, specifically address the interaction between cars and public transport
- Implement knowledge derived from behavioural science in the world of traffic & transport and do not overlook the fact that there are different lifestyles
- Run a huge number of pilot projects, and then implement the successful ones on a larger scale (but how?)

The NWO researchers then indicated which of Lintmeijer's points would be served by their research, showing their support by a show of hands. Various hands were raised for all three points - even the third. Lintmeijer then stated that the scientific research that benefits him most is related to effectiveness: what measures are truly effective at achieving sustainable accessibility in specific regions?

Where is the bicycle?

Then three mobility experts were interviewed together. Jaap Modder, chairman of the Arnhem-Nijmegen urban region, started out with a few sharp jabs at the research world and the new government. "The Randstad gets too much attention already; involve the other urban regions too!" was his first point. That message had already come through loud and clear – they're working on it. Another important point: "Expand the scope beyond the Netherlands. So much has already been done in other European countries; there's a great deal of expertise there." The SAR programme is already aware of this aspect; many researchers are collaborating with international groups, and there is an internationalisation scheme to bring foreign experts to the Netherlands. Lodewijk Lacroix (Haaglanden metropolitan area) mentioned a problem that many people are currently wrestling with: how can we achieve more with reduced resources where urbanisation converges with mobility? And what role might be played by other parties than the government? It was an issue that would be raised several more times on that occasion. Ben Immers, researcher both in the Flemish part of Belgium and in the Netherlands, has experience with scientific research with a healthy dose of practical application; he works with the ANWB road association. "The Netherlands really only has a network of main roads. That network is constantly clogged by traffic that has less than 30 km to travel.

Another network is needed, much more multimodal, with a much greater role reserved for bicycles.” The bicycle – which has not been included in current SAR research much yet – would also be mentioned several more times that day.

Fast, accurate research results

In two rounds of parallel sessions, the conference attendees then addressed various aspects of sustainable accessibility. There was a Group Decision Room on interventions in space and time (human behavioural patterns). There were also sessions on pricing, travel information, freight transport, the consequences that climate change could have for inner-city traffic, recreational traffic, and transit-oriented development. Back in the plenary room, three people closed the afternoon. Krijn Poppe, who works at Wageningen University and Research Centre, but is also chief scientist at the Ministry of Economic Affairs, Agriculture and Innovation, noted that the current SAR research has a strong focus on behaviour and uses multidisciplinary approaches. In his opinion, the scientists would do well to eliminate prejudices and misinformation among policymakers. This topic was raised several times during the day. Poppe did not consider it a problem that so many young researchers from other countries were working on the accessibility of Dutch regions. “They will be integrated into the research teams quickly and do a good job. Here in the Netherlands, we can also learn from them.” Finally, Poppe derided the misconception that science had to produce results quickly. “Of course, if that’s how it works out, it’s great. But we are talking about fundamental research here, so it should first and foremost be good research. There is room here for intermediary organisations that translate knowledge into practical application.” Lodewijk Lacroix immediately followed with a different note. “Scientific research often fails to reach local and regional governments. If you truly want to convey knowledge, you will also have to make sure that the current research programmes produce things that will immediately be useful in the coming years. Those results are certainly being achieved.” He concluded by expressing a desire that the parties in the aforementioned ‘love triangle’ would continue to meet in the coming time.

Communicate the 'no regrets' solutions

Jaap Modder was the third of the final speakers. He reiterated the importance of looking beyond the Dutch borders, and also emphasised the importance of applying knowledge that we already have. Other participants added that the involvement of the business community and the universities of applied sciences are also crucial in this respect: a point to consider in a subsequent conference. Perhaps the focus on that occasion could be on presenting initial results in the form of 'no regrets' measures: what steps could you definitely take to make accessibility more sustainably? What has already been proven to be scientifically sound? Hans Leeftang closed the event by linking several knowledge users and researchers in the room, e.g. in the area of mobility management (the role of free versus paid parking). In response to his closing question asking who would come to a conference like this again next year, 90% of those present raised a hand. After the social function, networking continued in a smaller group (with a number of new participants) which considered research questions for the near future. This was the very first Carrefour meeting, with more to follow. Carrefours are 'crossroads' – opportunities for researchers and knowledge users to meet and collaboratively guide future research by articulating knowledge questions. The themes formulated during the evening were all reviewed by the SAR programme committee and discussed with a number of experts from the scientific side and the user side.

All the presentations from this event are available on the SAR website at http://www.nwo.nl/nwohome.nsf/pages/NWOA_794DXJ_Eng

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8 Who's who in SAR?

First Round



Synchronizing networks

Programme leader: **Dr Eric Molin**, e.j.e.molin@tudelft.nl

- **Modelling of supernetworks**, PhD student Feixiong Liao, f.liao@tue.nl, supervisor Theo Arentze, t.a.arentze@tue.nl
- **Use of supernetworks**, PhD student Chao Chen, cchen@tudelft.nl, supervisors Eric Molin, e.j.e.molin@tudelft.nl, and Caspar Chorus, c.g.chorus@tudelft.nl
- **The governance of supernetworks**, PhD student Sara Levy, s.levy@fm.ru.nl, supervisor Karel Martens, k.martens@fm.ru.nl
- **Design of supernetworks**, post-doctoral researcher Wendy Bothe, W.Bohte@tudelft.nl, Eric Molin, e.j.e.molin@tudelft.nl



TRISTAM: Traveller Response and Information Service Technology

Programme leader: **Prof. Harry Timmermans**, h.j.p.timmermans@tue.nl

- **Analysis and Modelling of Network Effects**, PhD student Giselle de Moraes Ramos, g.moraesramos@tudelft.nl, supervisor Serge Hoogendoorn, s.p.hoogendoorn@tudelft.nl
- **Analysis and Modelling of Accessibility Effects**, PhD student Ruihua Zack Lu, r.lu@tudelft.nl, supervisor Caspar Chorus, c.g.chorus@tudelft.nl
- **Analysis and Modelling of Spatial Externalities**, PhD student Zarah Parvaneh, z.parvaneh@tue.nl, supervisor Harry Timmermans, h.j.p.timmermans@tue.nl
- **Analysis and Modelling of Economic Effects**, PhD student Sergejs Gubins, sgubins@feweb.vu.nl, supervisor Erik Verhoef, everhoef@feweb.vu.nl
- **Integration and Show cases**, post-doctoral researcher Anna Kononova, a.v.kononova@tue.nl, supervisor Harry Timmermans, h.j.p.timmermans@tue.nl



The value of recreation

Programme leader: **Prof. Bert van Wee**,
g.p.vanwee@tudelft.nl

- **The value of recreational areas in metropolitan regions**, PhD student Tom Gosens, tgosens@feweb.vu.nl, supervisor Jan Rouwendal, jrouwendal@feweb.vu.nl
- **Recreation and space: Dynamics of agenda formation and execution**, PhD student Anna Grigolon, a.b.grigolon@tue.nl, supervisor Astrid Kemperman, a.d.a.m.kemperman@tue.nl
- **Traveller response to unconventional trends**, PhD student Sander van Cranenburgh, s.vancranenburgh@tudelft.nl, supervisor Caspar Chorus, c.g.chorus@tudelft.nl
- **The planning of recreation: Choosing locations and managing accessibility**, post-doctoral researcher Kees Maat, c.maat@tudelft.nl, supervisor Bert van Wee, g.p.vanwee@tudelft.nl



Towards a sustainable multimodal freight transport system for the Randstad

Programme leader: **Prof. Lóri Tavasszy**,
lori.tavasszy@tno.nl

- **Modelling complex freight demand structures – trade and transport data**, post-doctoral researcher Maureen Lankhuizen, mlankhuizen@feweb.vu.nl, supervisor Henri de Groot, hgroot@feweb.vu.nl
- **Modelling complex freight demand structures – logistic chains**, PhD student Igor Davydenko, i.y.davydenko@tudelft.nl, supervisor Lóri Tavasszy, lori.tavasszy@tno.nl
- **System optimization of multimodal freight networks**, PhD student Mo Zhang, mo.zhang@tudelft.nl, supervisor Bart Wiegman, b.wiegman@tudelft.nl
- **A situated MAS for urban logistics in the Randstad**, PhD student Niles Anand, n.anand@tudelft.nl, supervisor Bert van Wee, g.p.vanwee@tudelft.nl

Second Round



CESAR: Climate and Environmental change and Sustainable Accessibility of the Randstad

Programme leader: **Prof. Martin Dijst**, m.dijst@geog.uu.nl

- **Impact of climate change on mobility and residential choices**, PhD student Lars Böcker, bocker@geo.uu.nl, supervisor Martin Dijst, m.dijst@geog.uu.nl
- **Developing and evaluation of a modelling framework for urban weather and climate studies**, PhD student Natalie Theeuwes, natalie.theeuwes@wur.nl, project leader Bert Holtslag, bert.holtslag@wur.nl
- **Improving integration of expert with tacit knowledge for strategic planning Processes**, post-doctoral researcher Marco te Brömmelstoet, M.C.G.teBrommelstroet@uva.nl, supervisor Luca Bertolini, L.Bertolini@uva.nl
- **Urban Strategy climate proof**, PhD student Niels van der Vaart, n.vandervaart@geo.uu.nl, supervisor Stan Geertman, s.geertman@geo.uu.nl



i-PriSM: Innovative Pricing for Sustainable Mobility

Programme leader: **Prof. Erik Verhoef**, everhoef@feweb.vu.nl

- **Implementation of transport pricing: an economic perspective**, PhD student Jonathan Verheul, jverheul@feweb.vu.nl, and post-doctoral researcher Jasper Knockaert, jknockaert@feweb.vu.nl, supervisor Erik Verhoef, everhoef@feweb.vu.nl
- **Transport pricing: a multi-modal dynamic network perspective**, PhD student Erik-Sander Smits, e.smits@tudelft.nl, supervisor Michiel Bliemer, m.c.j.bliemer@tudelft.nl
- **Acceptability of transport pricing: a psychological perspective**, post-doctoral researcher Jan Willem Bolderdijk, j.w.bolderdijk@rug.nl, project leader Linda Steg, l.steg@ppsw.rug

- **Implementation of road pricing: vehicle technology, governance, and institutional transition**, PhD student Ozgul Ardic, o.ardic@tudelft.nl, supervisor Bert van Wee, g.p.vanwee@tudelft.nl



SRMT: Strategy towards sustainable and reliable multimodal transport in the Randstad

Programme leader: **Prof. Ingo Hansen**,
i.a.hansen@ct.tudelft.nl

- **Spatial economic analysis of multimodal transport systems**, PhD student Yuval Kantor, ykantor@feweb.vu.nl, supervisor Piet Rietveld, prietveld@feweb.nl
- **Integrated transition strategy towards SFRMT**, PhD student Andrew Switzer, a.w.switzer@uva.nl, project leader Luca Bertolini, l.bertolini@uva.nl
- **Robust Multimodal Multi-objective**, PhD students Ties Brands (0.6), t.brands@utwente.nl, and Anthony Ohazulike (0.4), a.e.ohazulike@utwente.nl, supervisor Erik van Berkum, e.c.vanberkum@utwente.nl
- **Dynamic assessment of multi-modal transport networks**, PhD student Gijsbert van Eck, g.vaneck@tudelft.nl, supervisor Rob van Nes, r.vannes@tudelft.nl
- **Capacity management in SFRMT and reliable transport chains**, PhD student Daniel Sparing, d.sparing@tudelft.nl, supervisor Rob Goverde, r.m.p.goverde@tudelft.nl

Third Round



The feasibility and impact of the transition to electric mobility in the Randstad

Project leader: **Prof. Bert van Wee**,
g.p.vanwee@tudelft.nl

- **Economic and psychological aspects of the introduction of electrical vehicles**, supervisor Piet Rietveld, prietveld@feweb.nl

- **An institutional and managerial scientific perspective on the transition to electric vehicles**, supervisor Bert van Wee, g.p.vanwee@tudelft.nl



Mobility management and climate change

Project leader: **Dr Josvan Ommeren**,
jommeren@feweb.vu.nl

- **Public Policy and Firm Mobility Management: Implications for Climate Outcomes**, supervisors Jos van Ommeren, jommeren@feweb.vu.nl, and Piet Rietveld, prietveld@feweb.nl

- **Mobility Management and Space-Time Patterns: Implications for Climate Outcomes**, supervisor Martin Dijst, m.dijst@geog.uu.nl



Sustainable Maintenance Policy for Infrastructure Networks in the Randstad: A climate change perspective

Project leader: **Prof. Geert Dewulf**,
G.P.M.R.Dewulf@ctw.utwente.nl

- **Impact of climate change on infrastructure networks**, supervisor Pavel Kabat, pavel.kabat@wur.nl
- **Implications of climate change for maintenance policy**, supervisor Geert Dewulf, G.P.M.R.Dewulf@ctw.utwente.nl



9 The management structure of the SAR programme

The SAR research programme has a Supervisory Board, a Programme Committee, one or more internationally oriented ad-hoc Assessment Committees and an ad-hoc Policy Committee. The Programme Committee is responsible for the co-ordination and coherence of the programme, assesses the progress and draws up the budget. In addition, this committee is responsible for prioritising the research proposals on the basis of the outcomes of one or more Assessment Committees and promoting knowledge transfer to the users. The Supervisory Board allocates subsidy on the basis of the Programme Committee's advice and oversees the implementation of the research programme.

At the end of 2010, the composition of the various bodies involved in the SAR programme was as follows.

Supervisory Board

S. Riedstra, Ministry of Infrastructure and the Environment, chairman

P. Buijink, Ministry of Economic Affairs, Agriculture and Innovation

J.J. Engelen, Netherlands Organisation for Scientific Research (NWO)

H.J. Hazewinkel, VolkerWessels

J.M. Norder, Municipality of The Hague

J.W. Oosterwijk, Erasmus University Rotterdam (until his death on 29 May 2010)

J. van der Vlist, Office of General Affairs

Mrs A. N. Wouters, General Administrative Service, Ministry of the Interior and Kingdom Relations

Programme Committee

H. Leeflang, Ministry of Infrastructure and the Environment, chairman

Government representatives

A.J. van der Burg, Ministry of Infrastructure and the Environment
N. van Paridon, Amsterdam Metropolitan Region
E. Reiding, Ministry of Infrastructure and the Environment
Mrs O.A.W.T. van de Riet, Knowledge Institute for Mobility Policy
G.J. Schoemaker, Ministry of Economic Affairs, Agriculture and Innovation
E.J. Visser, Ministry of Economic Affairs, Agriculture and Innovation

Scientific representatives

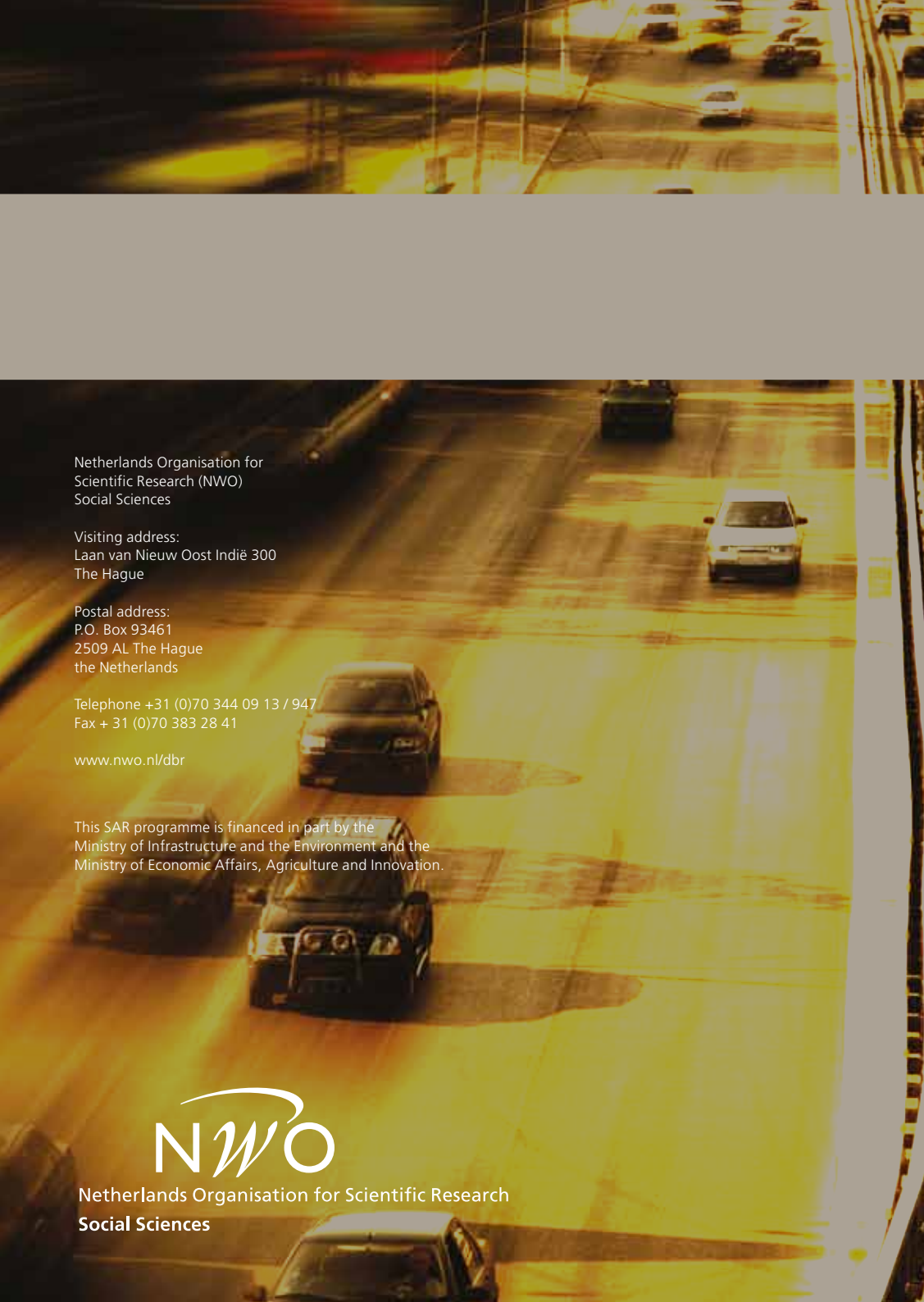
A.N. Bleijenberg, TNO
P.P.J. Driessen, Utrecht University
Dr M.A.J. Kuijpers-Linde, Geodan Next
H.J. Meurs, Radboud University Nijmegen
H. Priemus, Delft University of Technology
E. van de Voorde, University of Antwerp

Secretariat

H.W. Waaijers, NWO Social Sciences
J. Brouwer, NWO Social Sciences

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