

Five years of Sustainable Accessibility of the Randstad

Popular Annual Report 2012

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Foreword

Last November, as knowledge users and interested members of the public, we got an advance sneak-preview of the results from the programme Sustainable Accessibility of the Randstad (Duurzame Bereikbaarheid van de Randstad or SAR). It was my great pleasure at the time to be allowed to open the conference Connecting Sustainable Cities at the Beurs van Berlage in Amsterdam. Those who were involved were able to witness Professor Bert van Wee's (Delft University of Technology) speech, in which he presented an array of valuable insights and recommendations that have emerged from the SAR research. Much of what he told can be found in this annual report. With this report we continue the tradition of informing you about the highlights of the past year. The VerDuS-congress was certainly such a highlight, of which you'll be seeing an impression in this booklet.

Another highlight was the completion of the VerDuS website, on which the SAR-programme has its own place (<http://dbr.verdus.nl>). I highly recommend this website to you. In addition to various news and pages on which you can closely follow VerDuS's programmes and projects, you can also find the first notes in the context of the SAR Synthesis studies here. The goal here is to summarise the relevant practical knowledge that is available in a demand driven and theme based way. And so, in the course of 2013 and 2014 there will be many more knowledge based products. Because we have now entered the final phase of the project. A few post-doctoral researchers have already completed their work and we expect the first SAR promotion in spring.

Just like last year you will find portraits of PhD students and post-doctoral researchers in this annual review. They tell us about the most important findings from recent work. A number of them were guests at our department in June, when the second Young Scientists Meeting was being held, with not only SAR researchers but also PhD students from the NWO programmes Urban Regions of the Delta and Energy Transitions. Employees in our department saw inspirational presentations from SAR researchers, in which we were pleasantly surprised by the practically relevant knowledge conveyed by the young researchers. Though surprised, we were of course aware that the SAR research is driven by societal issues related to

sustainable accessibility of urban regions. So it was an added bonus to realise that the young research practitioners were also generating relevant results. That left us hungry for more!

Siebe Riedstra

Secretary-General, Dutch Ministry of Infrastructure and the Environment
Chairman of the Supervisory Board of VerDuS
(research theme: Connecting Sustainable Cities)

PS: See the (new) SAR website for the annual reports from 2008 to 2011:

<http://dbr.verdus.nl>

1 The year 2012 in summary

The year 2012 was the fifth year in which the SAR programme has been in full swing. This year the number of working research teams was provided with funding for another four final projects – two about transit oriented development and two about bicycle use. In 2012 two communities of research and practice were also started up and a knowledge transfer project was initiated under the supervision of Professor Bert van Wee in the form of so-called Synthesis studies.

It was another busy year for the SAR programme. In addition to the researchers' scientific work, their negotiation with their own user groups and the programme committee's activities, there was more going on. In January an article appeared in *RO Magazine* concerning accessibility as a factor in the economic development of urban regions. This was the theme of the SAR conference in 2011. In any case, the researchers had made themselves heard in various journals for spatial planning and mobility, including *S+RO*, concerning increasing bicycle use.

Evaluation and synthesis studies

The midterm evaluation of the seven long-term programmes from the first and second rounds of subsidies took place in February. A committee of four foreign reviewers looked at progress and scientific results and held interviews with the programme leaders. Dutch experts from the field were also involved in the evaluation. In general the evaluation turned out well and the programme leaders received tips and recommendations to further improve their research. The midterm evaluation also formed the starting point for the Synthesis studies. Professors work on this together with experts from three MIRT areas (the north- and south-wing of the Randstad and Brabantstad) to give a scientific answer to research questions that are practically relevant. In 2012 a notice appeared – concerning on trip provision of information – as the first result of this work.

Knowledge transfer

In the spring of 2012 the website for Verbinden van Duurzame Steden (Connecting Sustainable Cities), which SAR is a part of, went online. All information about SAR is on this site and is directly accessible via: <http://dbr.verdus.nl>.

In June a Young Scientists Meeting took place in cooperation with the Ministry of Infrastructure and the Environment. An impression of this can be found in chapter 6. There was also a large conference where SAR researchers presented their work and engaged in dialogue with field experts. In 2012 this happened, according to tradition, in November, but this time in a larger context than before. In addition to SAR research there were other programmes and researchers from the VerDuS team present. Over two hundred visitors were involved (See chapter 7).

The last four projects funded

The year 2012 was also the year that the two projects concerning transit oriented development (TOD) started. In the summer and in December two more research projects were added, both on the topic of bicycle use. The project leaders of the four projects tell more about them in chapter 2. What's special about the TOD and bicycle projects is that they involve cooperation with other researchers and field experts in two communities of research and practice. VerDuS network manager Jan Klinkenberg is the one pulling the strings here.

Taskforce Mobility and Space

The TOD community – now known as Taskforce Mobility and Space – is a cooperative project between VerDuS, Transumo Footprint, the Innovation Council Infrastructure and Space of the Dutch Ministry of Infrastructure and the Environment, the metropolitan area of Arnhem-Nijmegen and the Deltametropool Association. In addition to the practical support of three large scientific research projects (two from SAR and one from the programme Urban Regions in the Delta) the Taskforce wants, amongst other things, to serve as an 'expertise desk for hub development' for pilot schemes with TOD in the Netherlands and in doing so support policy makers and practical groups with specific knowledge and expertise.

Cycling community

The 'cycling community' is an initiative of SAR, Transumo Footprint, Dutch Cyclists Association (Fietzersbond) and the Centre of expertise on bicycle policy (Fietsberaad)/CROW. The community facilitates and organises interaction with national (and where necessary/possible international) cycling issues (municipalities, consumer organisations, ProRail, NS and such like). In the projects themselves this interaction remains limited to the parties that have committed themselves to the research (the municipalities of Amsterdam, Groningen and Amersfoort). The community mobilises public and private parties to contribute additional expertise and practical experiences to the cycling research project. The group also organises discussion with user groups and stakeholders, through which cycling research can be placed in a broader context (think of utilisation policy, Work Smart Travel Smart and so forth).

International contacts

Since 2012 SAR is complete, with a total of fourteen programmes and projects in which around 44 PhD students and post-doctoral researchers are involved. In order to promote cooperation with foreign experts, eight additional applications have been granted within the framework of SAR's internationalisation scheme in 2011 and 2012. This presents excellent foreign researchers with the opportunity to work with the SAR research for a maximum period of one year.



2 Four last projects started

Transit Oriented Development and bicycle use

In 2012 the four final projects within the SAR programme were allocated. Two post-doctoral projects have started related to the theme transit oriented development (TOD). The other two concern use of bicycles. In this chapter the project leaders explain what is included in their projects. A community of research and practice was set up for both topics in which researchers and field experts can exchange information, knowledge and experience.

Obstacles to overcome regarding transit oriented development

The project 'Implementing TOD' is headed by Prof. Luca Bertolini (University of Amsterdam). The work is being performed by Sander Lenferink (Radboud University Nijmegen, under supervision of Prof. Erwin van der Krabben), Dorina Pojani and Verena Balz (Delft University of Technology, under supervision of Dr. Dominic Stead) and Ren Thomas (University of Amsterdam). Luca Bertolini: 'TOD stands for the coordination of the development of locations and that of traffic and transport networks, and in particular for the concentration of spatial developments around hubs where cars and public transport come together. This can help with the economic and social functionality of the northern Randstad, through ensuring that the most important destinations are at the most accessible places. TOD can also help to make mobility more sustainable in the northern Randstad, through ensuring that the most important locations are less dependent on cars.'

How can TOD be implemented in the northern Randstad?

'Our project is focused on how TOD can be implemented in the northern Randstad. We know that TOD can indeed be hard to get off the ground, even when TOD is adopted in policy and there seems to be a consensus between stakeholders. Why is that? And how can we change it? We try in particular to provide an answer to three questions. The first is which spatial and transport policy regulations can push towards a breakthrough

of TOD in the Randstad. The second concerns the question of public-private financial arrangements. The third question is what information, and in what form, can help the relevant stakeholders to embrace each other?’

Collecting and systematising success factors

‘Quite a lot of research has already been done internationally about TOD implementation. However this doesn’t go much further than outlining best practices and making rather vague lists of success and fail-factors. Because of that application elsewhere is problematic. I think the biggest challenge presented by this project is to systematise this fragmented, anecdotal knowledge and to thereby make it practically applicable to the northern Randstad and other urban areas.’

Collaboration with professionals from the field

Various social groups are involved with the project and represent different sorts of stakeholders, tells Bertolini. ‘Those are the municipality and metropolitan area of Amsterdam, the Province of North Holland, Schiphol Airport, the Deltametropool Association, the citizens’ initiative De Kracht van Utrecht, Bouwfonds and consultant Goudappel Coffeng. We have already had a lot of positive experiences with comparable cooperative efforts between science and the practical world, for example in the projects involving ICES-KIS and Platform 31 (formally Nicis Institute). The most important factor is that, for both parties, something clearly useful is involved. For the practical world this mainly means concrete suggestions for innovation, but sometimes just involves taking some time to reflect, at a distance from the issues of the day. For science it is the possibility to use the practical world as a laboratory for generating tests and hypotheses. Specifically our project involves two forms of cooperation. The first is continuous feedback about the science from the practical world in all phases of the research, from launching the proposal to the dissemination of results. The second is more ambitious and involves the joint setting up of experiments in order to explore the concrete applicability of the insights gained.’

Exchanges in the Taskforce Mobility and Space

‘The goal of the taskforce is to facilitate exchange between the projects themselves and between projects and the practical world. This is an essential task, and something that doesn’t just happen on its own. It provides the opportunity to achieve synergy between findings in different regions and from different perspectives and to bring the impact of the research in practice further than the project consortium. It comes at a time at which much research into TOD is being done (also outside SAR), and at which many parties seem to want to get involved in practice. These initiatives are rather fragmented and sometimes not even aware of each other. It would be fantastic if the taskforce could act as a catalyst in this area and help to achieve a breakthrough for TOD in the Netherlands. Our contribution is twofold: on the one hand we want to deliver a significant part of the knowledge and the practical networks, on the other hand we want to contribute our thoughts about the most effective work methods.’

Achieved in 2012

The project started in the summer of 2012. Since then Ren Thomas has selected eleven international case studies (including three that are Dutch), for which she has identified the critical success factors. She does this through, amongst other things, a meta-analysis of existing case studies and interviews with local experts. Sander Lenferink has made a inventory of innovative models for transit oriented development. The models concern financial, legal and governance instruments that can stimulate TOD, but are either not yet established or are just limited in the Netherlands. Furthermore Sander has researched the practical TOD situation in the northern Randstad to see where the innovative models could be experimented with. At this time the Zaancorridor (roughly in between Heerhugowaard and Amsterdam Sloterdijk train stations) seems to offer the most concrete possibilities. Dorina Pojani and Verena Balz have focussed themselves on understanding knowledge and information processes related to TOD planning concepts, with special attention given to learning from experiences in other countries. In this case it is as much about policy documentation as scientific literature. Additionally, they do research with civil servants and other stakeholders.

Stimulating TOD in the southern Randstad

Karst Geurs (University of Twente) leads the project 'TOD in the Randstad Southwing', about strategies for the integration of urban development and transport hubs in the "Stedenbaan" (city track). The post-doctoral researchers within the project are Hans Koster (VU University), Martijn Dröes (VU University), Christa Hubers (Delft University of Technology) and Lissy La Paix Puello (University of Twente). The researchers are now partly busy and the preparatory phase is behind them. Data collection begins in 2013.

StedenbaanPlus

Karst Geurs tell us: 'StedenbaanPlus is known as a regional cooperative effort between regional and local governments, NS and ProRail, who voluntarily work together to realise spatial compaction around NS stations. The idea is that compaction provides more passengers, with which the NS can achieve an increase in the frequency of sprinters (regional trains) in the Southwing of the Randstad. The motive for the research is the effect of the economic crisis in the property market on the possibilities for TOD. Another motivation is the increase in the number of stakeholders through the scaling up of Stedenbaan to the whole Southwing of the Randstad. As a result of this competition is created for new spatial developments between individual hubs within StedenbaanPlus. For mass-transit passengers this means competition between for example tram, sprinter and intercity.'

What are smart development strategies for StedenbaanPlus?

The researchers from Geurs' project want to discover what are effective and efficient development strategies for StedenbaanPlus in the mid and long term. They also want to know what lessons can be learned from successful TOD projects in Europe and North America concerning governance issues. Geurs: 'In the sub-projects we focus on the effects of improvement of accessibility of stations for pedestrians and cyclists and other properties of stations on train usage and regional accessibility. A second question is what are the spatial economic effects of different TOD strategies, taking into account the competition between municipalities for new spatial developments. Finally we want to know what the current market

opportunities are for TOD. To what extent and under which conditions are people prepared to live in close proximity to stations?’

Knowledge development directly focussed on practical use

‘The most important challenge is, in the short duration of the research – two years – to conduct scientific, innovative research and get research results which the practical world – in our case for StedenbaanPlus – can actually make use of,’ tells Geurs. ‘In our programme we work together closely with StedenbaanPlus. In StedenbaanPlus regional and local governments in the Southwing of the Randstad, NS and ProRail work together on a shared business case for an increase in frequency of the sprinters. I expect a good and close collaboration. The first result of the collaboration has already been reached: we have presented a joint paper with StedenbaanPlus at a TOD congress in Paris in mid-April 2012, before the start of the programme.’

How TOD practice will benefit from knowledge

‘The research focuses on providing scientific insights into what are effective and efficient development strategies for StedenbaanPlus in the mid and long term. This directly helps the programme StedenbaanPlus with the development of a regional vision of the future.’ Geurs works with other TOD researchers in the Taskforce Mobility and Space. ‘The different projects complement each other very well in the designs that are being studied, and we expect a productive collaboration. Our project is more focussed on the mobility, accessibility and societal effects of TOD, while the other SAR and URD projects deal with governance issues related to, for example, financing and conducting practical experiments. This way the various research projects cover a large range of issues related to TOD. VerDuS is thus very unique.’

Insight into the dynamics of bicycle use

Luca Bertolini also leads the research project ‘Understanding social and spatial dynamics in bicycle use in the Randstad and its policy implications’, together with Dr. Marco te Brömmelstroet, who also works for the University of Amsterdam. The project is being carried out by Dr. Lucas Harms. The motivation is the change in bicycle use in the Netherlands

in the past few years. However much the amount of bicycle use for the Netherlands as a whole always seems to stay the same, bicycle use has risen in some regions and cities, whereas in other places riding a bicycle is becoming less and less popular with certain social groups. This growing spatial and social differentiation of bicycle use has important implications for policy makers in the Randstad. This project investigates precisely what.

Exploiting opportunities and risks for bicycle use

Bertolini: 'Our project consists of two sub-studies. The goal of the first sub-study is to inventory the social and spatial trends in bicycle use. Thereby we distinguish between differences in trends amongst groups of people (man, woman, young, old, immigrant, native) and differences in trends between areas (city versus countryside, and differences between cities and within cities). Ultimately this should provide an overview of geographical and anthropological opportunities and risks for bicycle policy. In line with this, in the second sub-study we look at the effectiveness of policy directed at stimulating bicycle use. The purpose is to identify success factors for bicycle policy based on a comparison of international policy measures: Which policy measures work and which do not? And why does one work well in certain places with certain groups but under other circumstances does not?'

Catching up

Bertolini sees the biggest (scientific) challenge of the project in the fact that the Netherlands has got some catching up to do in the field of bicycle research. 'Globally the bicycle is growing rapidly in popularity. Not only is there more cycling going on in many countries and cities, but there is also more and more scientific research being done into bicycles and cycling behaviour. Every week there are symposia, congresses or readings to follow about the subject. Strangely enough when it comes to bicycles the Netherlands has some catching up to do, at least scientifically speaking, especially when you compare our current contribution to the international debate with the wealth of experience and data that we have in this country. Together with researchers from the University of Groningen we are working hard to catch up. Finding our own research a visible and international place remains a challenge. Once that has later been achieved, I think we would have made a big step forward. Naturally it is then important to persevere

and to turn the scientific lag into a definitive lead that keeps pace with the unique position of the Netherlands as a cycling country.'

Working with the practical professionals

The goal of the recently set-up Community of Research & Practice for the bicycle is the exchange and enrichment of knowledge between scientists on the one hand and the practical world on the other, Bertolini tells us. 'In this context the practical world consists mainly of policy makers and traffic experts from medium sized municipalities such as Amsterdam, Amersfoort and Groningen. Consultants from advice bureaus and societal groups like the Dutch Cyclists Association (Fietzersbond) and the Centre of expertise on bicycle policy (Fietsberaad) also contribute. The collaboration gains form through meetings at symposia, but also through online discussions. So it is our intention to start a website in the course of 2013 that can function as a discussion forum for and about our research results. With this continuous exchange we hope on the one hand to sharpen our research questions and hypotheses, and on the other to have a direct impact on innovations in bicycle policy.'

The bicycle as pre- and post-transport

The final project within SAR 'The role of the bicycle as an egress and access mode for multimodal nodes' was granted in December 2012. Professor Gert van Roo (University of Groningen) is directing it and Dr. Eva Heinen is carrying it out. The motivation is to answer questions concerning pre- and post-transport. Cycling is becoming more popular as part of multimodal and synchromodal journey chains. The bicycle is mainly used in combination with the train and then more often as pre-transport than as post-transport. The recent growth in bicycle popularity would suggest that there is a possibility of even further growth in bicycle use for pre- and post-transport, as much for train journeys as for other modes of transport, such as the car. The goal of this research is to attain insight into current use of the bicycle as pre- and post-transport in multi-modal hubs, and also to discover the potential bicycle use in the immediate future and determine the requirements that must be fulfilled for this to be reached.

Getting to work in Amersfoort and Groningen

Researcher Eva Heinen explains. 'The research focuses on the use of the bicycle in the transport chain. The central goal is therefore to determine which measures can lead to an increase in the use of bicycles in the chain and how these can be effectively implemented. We also want to measure and explain the effects of these measures on behaviour of passengers, both for the long and the short term. To this end we will research the societal trends and trends related to cycling in the chain. Next we will perform research into the potential of the bicycle as post-transport. We will determine the exact focus after preliminary studies. What is fixed is that we will perform the research in Amersfoort and Groningen and that we will specifically focus our efforts on the bicycle as a post-transport part of the chain. Our data will most likely be collected using questionnaires. The eventual goal is to come up with recommendations to strengthen the role of the bicycle as post-transport.'

Action research

The research will take place in collaboration with the municipalities of Groningen and Amersfoort. Heinen: 'On the basis of findings from the trend analysis we will develop a plan for follow-up research into the potential of the bicycle as a part of the chain. This proposal will be discussed with the partner cities and possibly the broader community of research and practice that was set up for bicycle research in 2012. The discussion may lead to an adjustment of our action research-approach and of the eventual focus that we choose. The community of practice also plays an undeniable role in the connection between policy and research.'

3 Three post-doctoral projects halfway

Mobility management, a climate resistant management and research into infrastructure and electric transportation

In 2011 six new post-doctoral researchers started work in three different programmes. Linda Nijland (Utrecht University) and Eva Gutiérrez-i-Puigarnau (VU Amsterdam) are researching different mobility management instruments under the supervision of Professor Jos van Ommeren (VU Amsterdam). Herbert Termaat (Wageningen UR) and Irina Stipanovic (University of Twente) are studying the relationship between climate change and the management and maintenance of motorways and train tracks, under the supervision of Professor Geert Dewulf (University of Twente). Sjoerd Bakker (Delft University of Technology) and Marija Bockarjova (VU Amsterdam) are busy looking at the transition to electric transport, under the supervision of Professor Bert van Wee (Delft University of Technology).

Mobility management: teleworking is also a factor

How employers and employees handle mobility issues is vitally important to the accessibility of the Randstad. In 2011 and 2012 the research staff have kept themselves busy looking into tax policy on lease cars. One of the conclusions is that the favourable tax regime for lease cars – with more than 20% of households – leads to the use of larger and more polluting cars. The researchers recommend that the government raises tax on lease cars. At the same time the research shows that a policy in which tax on lease cars remains the same, tax on normal cars is decreased and the tax on larger cars increased would combat the over-consumption of cars without resulting in loss of wealth. In the meantime the researchers are focussed on teleworking. Van Ommeren: 'For example, we want to figure out to what extent the chance of teleworking increases if someone lives further from their place of work. The more teleworking, the better for the environment. But we also want to find out if someone would choose to live further from

their place of work if they were permitted to telework by their employer. That would then be a negative development for the environment.'



Researcher's perspective

Linda Nijland does research into the effects of government policy on the mobility behaviour and patterns of activity of employees and their households.

'In 2012 I concluded my literature review. I have also made a plan for the articles I will write within the project about different kinds of mobility measures and their effects on the mobility behaviour and patterns of activity of employees and their households. At the end of 2012 I began analysing the available data.

The highlight for the research project was finding a suitable data-set for my research. My personal highlights in 2012 were the birth of my daughter and the publication of two articles in the scientific journal *Transportation*.

As far as the research results are concerned it seems that if employees are compensated for their commute – in particular the lease car drivers – they seem to be better off in nearly all areas. These employees have, for example, the chance to work from home more often, more flexibility in their work hours and a higher income.

There is, by the way, already a lot of research available on the topic of mobility measures for teleworking. That makes it nearly impossible to get a good overview of what has already been done and what could still be interesting niches.

For me the year 2013 will be characterised by the production of results, the writing of articles for scientific journals and the visiting of congresses.'

Climate-resistant management and maintenance

What consequences will climate change have on infrastructure management and maintenance? Researchers Herbert Termaat (Wageningen UR) and Irina Stipanovic (University of Twente) strive for improvement of

the decision making process through organisations in the Randstad that are responsible for the management and maintenance of infrastructure. In doing so, the scientists link three fields of research: climate change, infrastructure performance and policy development. They have been working on this project since March 2011. The part concerning train tracks has now been completed. Important conclusions are:

- Snow, ice, storms and high temperatures are the most critical weather conditions that can lead to an incident on the tracks.
- The chance of incidents occurring rises exponentially if the temperature rises above 20°C or drops below 0°C.
- The chance of incidents rises with a snowfall of more than 10 mm.
- The chance of incidents as a result of low temperature will drop with the expected changes in climate. Based on the W +-scenario from the KNMI'06-scenarios the chance of incidents may even be reduced to half.
- The chance of incidents as a result of high temperature will increase with the expected changes in climate.



Researcher's perspective

Herbert Termaat develops climate scenarios that are relevant for the management and maintenance of railway infrastructure.

'In 2012 my colleagues at the University of Twente and I have had a lot of contact with two stakeholders, namely ProRail and Rijkswaterstaat (The Dutch Department of Public Works). Research into the effect of climate change

on infrastructure also runs mainly along these lines: rail and road. Good progress has been made in the quantification of the effects of climate change on infrastructure and is currently being written up as a scientific article. For this we have performed an analysis of weather related problems on the railtracks in period of 2000-2011. With the help of calculations a projection has been made of how these problems could change in the climate of the future. The climate projections that we have used come from recent EU research projects, but we have also made use of the KMNI-scenarios.

Contact with Rijkswaterstaat really just got going in 2012 and in the meantime we have gained access to data that will be very useful within our project.

One of the highlights of 2012 for me was that, together with the University of Twente, we have been able to conduct a broad analysis of disruptions on the railway network in the Randstad in the period of 2000-2010 and that we have been able to correlate this with the weather conditions at the time of each disturbance. With help from this analysis we have also been able to make an initial estimation of the effect of climate change on the number of disturbances.

What's special about our project is the close collaboration with stakeholders. It is nice to see the enthusiasm with which they accept our research. They also see the value of the research we are doing. Although I do find it hard that the tempo and priorities of my research do not always correspond with those of the stakeholders.

In 2013 I will write up the first results regarding the railway section. In this period of time there will also be a focus on the road section. In this context we are now working closely with researchers from the University of Colorado as part of an international collaboration as is possible within NWO-SAR.'

Electric transportation: Tempering high expectations

Sjoerd Bakker (Delft University of Technology) and Marija Bockarjova (VU University of Amsterdam) 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. They will also study the position of other parties, such as government authorities, the automobile industry and energy companies. One of the questions addressed is how these stakeholders can be encouraged to collaborate so that they can also contribute to the successful introduction of electric vehicles.

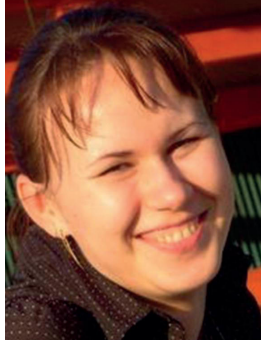
Many factors are called into question when purchasing an electric vehicle

Marija Bockarjova worked on a survey in 2012 with which she can perform research into the technical, psychological and economic aspects of the introduction of electric transportation. The survey was conducted via internet, whereby the respondents to Panel Inzicht were surveyed, resulting in 2,974 responses. Bockarjova: 'I am still analysing the data but the first results show that respondents do not think very positively about fully electric vehicles. However, approximately 40% would choose an electric

vehicle if given the choice between conventional fuel, electric or hybrid. When determining the intention to buy an electric vehicle, car properties such as trade price, retail price, operating costs, operating range, charging time, detour time, CO₂ emission and a towline connection are of interest. Additionally, environmental aspects appear to be very important, such as the seriousness of environmental problems that conventional cars cause, the personal vulnerability to environmental risks and the capacity of electric cars to solve them.' Environmental factors are important in determining individual preference in the so-called take-off phase of introduction (when the 'early majority' starts using the cars) and in the ripeness phase (during which the 'late majority' and the 'stragglers' start using the cars). (See also the interview with Marija further on.)

Parties expect regulatory pressure

In 2012 Sjoerd Bakker asked various parties, commercial and otherwise, to what extent and why they support the development of electric vehicles and in what direction they have attempted to steer the ongoing developments. Bakker: 'Motivations appear to vary but the most important stems from the current and the expected future regulatory pressure. This pressure is pushing incumbent automobile manufacturers towards development of (plug-in hybrid) electric vehicles. This creates both an opportunity and a threat to other stakeholders in the automotive and electricity sectors. Our study indicates that it is not only a positive interest in the success of the emerging technologies that is motivating stakeholders to interfere with developments. As we have seen for the electricity sector, and the grid operators in particular, electric cars are as much a threat as they are an opportunity. The interests and strategies of the parties involved are very dependent on the various options that the new system offers. It concerns the division of responsibilities with regards to the public charging infrastructure, the allocation of charge points, the way in which charge behaviour can be influenced, the role of rapid charging and the standards that can be used.'



Researcher's perspective

Marija Bockarjova researches the adoption of electric vehicles by consumers in the Netherlands.

'In 2012 I have been particularly focussed on the determination of functional or non-functional factors that either ease or hinder the adoption of electric vehicles by consumers. The highlight of the year was the collection of data. I have managed to find nearly 3000 respondents who

all filled in a long survey. Completing the survey took on average 30 minutes. And above all I have stayed within my project's budget!

The most remarkable discovery so far is that Dutch drivers do not find the limited operating range of the electric car to be its biggest limitation. It is rather the time it takes to charge that is a problem, in particular when using rapid charge. With a limited charge infrastructure charging can take up to 45 minutes, including detour time, waiting and the charging itself. Furthermore, a consumer's intention to buy an electric car depends on their knowledge of alternative automotive technologies and environmental factors, such as the seriousness of the problems that are caused by conventional vehicles. Noise and air pollution are two examples of this. In this case the extent to which people believe an electric car can solve these environmental problems plays a part.

I found the biggest challenge in my research up to this point was the development of the questionnaire. Once the results from the survey have come in, it is obviously too late to change the questions. In 2013 I will be further analysing the data that has come in and then I hope to be able to present more revealing findings!'

4 Three programmes two rounds until last phase

Strategies for sustainable accessibility, pricing policy and the relationship between climate, space and transport

The three long term research programmes from the second round SRMT (about a sustainable, multimodal transport network in the Randstad), iPriSM (about innovative pricing policy) and CESAR (about weather, climate and transport in the city) are now in the second half of their duration. What has been achieved in 2012?

SRMT Cohesive strategies for achieving sustainable accessibility of the Randstad

The researchers working on SRMT are developing cohesive 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 Professor Emeritus 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. The different panel members contribute actively, for example by delivering data. Close collaboration takes place between the five main researchers within projects.

A more realistic model for functions in the city

In 2012 PhD student Yuval Kantor (VU Amsterdam) once again worked on an urban economic model with a multimodal network structure. With this he can determine indirect economic effects (wages, rent) of urban transport structures. Kantor: 'The result is a stylized 'land-use map' of the

city, on which functions like living and working are specified according to an economic balance. That is to say that everyone in the city has a job and that no single organisation or resident has a better place to go. I add congestion-effects to the basis of the model, because in a multimodal transport environment different transport methods vary in congestion that brings large numbers of people with it. Larger traffic flows result in higher travelling costs through the increased use of the transport infrastructure. The patterns for various functions in the city, such as living and working, that are derived from our model, are less centralised than in a situation without congestion. I had expected this to be the case, given that this finding is consistent with higher fixed transport costs in the original non-congested model. We do however see that our model can deal with a broader range of functions than the original models. These models assume zones with only economic activity, pure residential areas and zones with a mixed activity pattern whereby residents have no commute. The maps generated by our model are much more realistic, because personal and business activities are mixed between zones and there is also commuting within, to and outside these zones.

Many developments affect the transition to TOD

PhD researcher Andrew Switzer (University of Amsterdam) has been conducting an international comparative case study into the mechanisms that play a role in the transition to transit oriented development (TOD). Switzer: 'The cases take place in Zurich and Munich – relatively successful examples of the balancing of mobility and spatial planning. In 2013 a publication is coming out in which I explain the relationship with the model I had already developed earlier. In that model it is revealed how balancing space and mobility is dependent on the actions of various actors and exogenous developments, and how space and mobility are affected by the existing institutional structures. Case study number three concerns the Southwing of the Randstad and will be carried out in 2013. Until now my findings support the importance of consistent policy, as has been shown by earlier research. Additionally, political leadership seems to be important. Other factors that must be taken into account in the transition to TOD are societal protests against, for example the demolition of buildings for the construction of infrastructure or indeed positive support for the objectives from the general public. Developments in economy, environment and the political climate also play an important role.'

Achieving different objectives in the network

PhD student Ties Brands (University of Twente) has continued work on the method to optimise the development of transport networks whilst taking various policy goals into account simultaneously. The method was tested in the Amsterdam-Haarlem area. The method combines different policy goals such as accessibility and reduction of CO₂ emissions, and looks at which routes would be the most optimal. Brands: 'In this case study I have demonstrated that a 2% reduction in CO₂ emissions and a 1.5% reduction in travelling time are achievable by using multimodal network options. This means that in this case the public transport system will need a larger operating contribution.' Brands is now working on ways to effectively analyse the results his methods have provided. The plan for 2013 is to work on the robustness of the method in the longer term, in relation to changing demand scenarios. The researcher: 'I want to know to what extent a different future would lead to a different network development. We will be testing various demand scenarios.' (See also the interview with Ties further on.)

Deployment of toll collection – better outcomes with a new game approach

PhD student Anthony Ohazulike (University of Twente) has focused on the deployment of toll collection as a tool to optimally distribute the traffic in a transport network. 'In our project we use game theory approaches, whereby different stakeholders who are influenced by a road pricing system take part in the development of the charge but have conflicting interests. We do this because studies in different countries have shown that toll collection fails if the stakeholders are of the opinion that they have been left out of the development process. With our simulation model we can ensure a fair form of toll collection, whereby the interests of everyone involved are considered equally during the development process. As a by-product of this simulation model we have found a new way to solve 'multi-objective' problems – for situations where different objectives must be realised simultaneously. It involves an approach whereby each objective is 'managed' by a stakeholder.'

Different transport modalities in one choice model

PhD student Gijsbert van Eck (Delft University of Technology) continued with the construction of a multimodal transport choice model for the Northwing of the Randstad and with the development and evaluation of the generation of different route possibilities. Van Eck: 'I have carried out a realistic case study in the Amsterdam-Schiphol-Haarlem area and have compared and optimised different methods. I am now working on the development of a choice model for route, transport method and departure/arrival time. I have carried out a literature study to identify the current choice models for prediction of multimodal transport choices and determine their shortcomings. After that I will develop and test a new choice model for the same case study area. Then the most important remaining challenge is to integrate a dynamic network of multimodal travel. Here both private and public transport are used in the same journey. I have also been working on a number of technical issues related to modelling. The Matlab model was good for modelling purposes but less suited for database management and the visualisation of networks. In these cases I make use of the existing model OmniTRANS. This is a better way to put the results in the spotlight.'

Modelling of delays and their prevention

Scheduling of public transport is central for PhD student Daniël Sparing (Delft University of Technology). He develops instruments that can evaluate the scheduling of multimodal public transport. 'I have developed a model with which the railway can be used optimally: with a maximum passage of trains with different line frequencies and stopping patterns. The model makes it possible to perform an effective analysis of the effects of changes in scheduling on the capacity and stability of the timetable. Now I am focusing on special methods and algorithms so that the model can be applied to a network as large as the Randstad. Additionally, I've been working on an optimisation model for the managing of connections during transfers and delays. This model minimises passengers' total delay by calculating the propagation of delay within multimodal transport networks. Decision variables here are the maintenance of the connection or even the cancelling of connections, like NS did during last winter with their adjusted schedules. For this purpose I make use of the actual arrival and departure data for urban public transport routes. This way I can model the delay more accurately.'



Researcher's perspective

Ties Brands is working on a multimodal traffic model that can take different objectives into account simultaneously, such as decrease in travel time and reduction in CO₂ emissions.

'In 2012 I got the so-called optimisation framework up and running. This concerns the connection of a multimodal traffic model for the Amsterdam-Haarlem-Schiphol region in the OmniTRANS software package with an optimisation algorithm in Matlab, that takes multiple objectives into account: minimalisation of journey time, urban footprint, CO₂ emission and public transport operating contribution. I've been experimenting with this, which basically comes down to booting up two computers, that spend approximately two weeks calculating each optimisation. That has supplied input for two papers that I have written. One of them concerns the significance of the outcomes to traffic management, the so-called Pareto-set, that charts the balance between multiple objectives. A Pareto-set actually involves a whole range of possible network developments. And the other paper concerns the variation between different Pareto-sets, from different optimisations. The analysis of differences between Pareto-sets is very difficult, especially the differences between the network developments within these Pareto-sets. In fact – as far as I know – this is unexplored territory in the literature. But that of course makes it very interesting to be working on.

For me the highlight of 2012 was seeing the first outcomes from the optimisation framework, and then ascertaining that the results were logical so that their analysis could be started. In my opinion the most remarkable outcome up to this point has been that the construction of a park and ride scheme contributes less to the objectives than the improvement of the public transport network itself. Concerning this last point consider new public transport routes, higher frequencies and new intercity stops. So multimodal movements will occur spontaneously if a good quality public transport system is available.

In the near future I will be continuing work on the optimisation framework. For example, we will be testing the robustness of the outcomes for changes in traffic demand. And it is our intention to use the model that has been developed at Delft University of Technology, also in the context of the SRMT project, to evaluate network developments in more detail in terms of objectives.'

CESAR climate change, spatial planning and transport behaviour

The first challenge of the CESAR programme, led by Professor Martin Dijst (University of Utrecht), is to decipher the complex relationships between built-up urban areas and infrastructure, meteorological processes and behavioural patterns with regard to mobility, residential choices and car ownership. CESAR will then integrate that 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. Representatives of the municipality of Amsterdam, the Dutch Cyclists Association (Fietzersbond), the Rotterdam metropolitan area and the Knowledge Institute for Mobility Policy (KIM) are members of the CESAR user panel.

Less cycling the hotter it is

PhD student Lars Böcker (Utrecht University) has performed large scale fieldwork in the Rotterdam region. How does weather affect a person's choice of transport method. Böcker: 'It is noteworthy that very high temperatures and not just low temperatures can have a negative effect on cycling. This had already been suggested in the literature, but empirical evidence for this effect had not often been found.' (See also the interview with Lars further on.)

Model for urban temperatures within sight

PhD student Natalie Theeuwes (Wageningen UR) tested the meteorological Weather Research and Forecasting model on a mesoscale for the urban climate in the Randstad (in this case, Rotterdam) in 2011. Through observation and use of the meteorological model she has researched the relationship between temperature and urban morphology. Theeuwes: 'The connection between temperature and a street's geometry is striking. Higher buildings do not necessarily result in higher nightly temperatures. This effect is season dependent. We are now making a simple model for urban temperatures using the results we found.'

The value of a planning support system is becoming clearer

Post-doctoral researcher Marco te Brömmelstoet (University of Amsterdam) has developed a framework for optimising the use of planning support systems, such as Urban Strategy, which spatial planners and policy makers can use to anticipate climate and weather changes. Te Brömmelstoet: 'By working within a systematic, analytical framework, we are in a better position to measure the value of planning support systems than before. The first findings from controlled experiments by planning students show that Urban Strategy has systematic positive effects on individual enthusiasm, credibility of outcomes, consensus and insight into the causes of urban problems. With these insights and by observing why no systematic effects are visible using other indicators, we can continue work on useful systems. For this reason we will focus on using variations with different methods to deploy a planning support system in future experiments.'

Taking a practical approach to instruments

PhD student Peter Pelzer (Utrecht University and Radboud University of Nijmegen) researches planning support systems like te Brömmelstoet. However, he focuses more on practical experiences. Pelzer: 'In the literature about planning support systems instruments are often used to support argumentation. It is assumed that policy makers will make use of them in any case. In my research I instead look at things from the demand standpoint. What sort of instruments do policy makers need? To answer this question I use (group) interviews, observations and surveys. In the last year I have, amongst other things, researched the use of the instruments Urban Strategy (TNO) and MapTable (Mapsup), and the shaping of a Mobility Vision in the IJmond. An important question that I hope to answer in the coming year is how planning support systems can lead to a better exchange between different disciplines in the planning process, such as urban planning, traffic engineering, environment and spatial planning.'



Researcher's perspective

Lars Böcker studies the impact of socio-demographic and spatial configurations in land use and infrastructure on people's choices concerning activities, transport methods, residence and car ownership under different weather conditions.

'In the spring of 2012 we started making preparations for large scale fieldwork among 1300 respondents in the Rotterdam metropolitan area. We researched the effects of weather conditions on daily travel behaviour. This fieldwork started in August 2012. Up to and including February 2013 the respondents recorded their movements for two days in the summer, winter and autumn, including the time of travel, the transport method used and how they experienced the surroundings and the weather conditions on the way. Since the Autumn we have been very busy interpreting the first provisional data that this fieldwork has produced. We have been working on this together with meteorological experts from Sweden.

We took a broad look at the effects of weather conditions on choice of transport type. It is noteworthy that we found that very high temperatures and not just low temperatures have a negative effect on cycling. This had already been suggested in the literature, but empirical evidence for this effect had not often been found.

The analysis and interpretation of data can sometimes be difficult. Sometimes you think that you'll quickly be able to figure something out, but this approach usually falls short. Only by working with great care and by testing all options do you eventually reach your goal. In the process it is very important to document each intervening step carefully. Furthermore it is sometimes hard to maintain a clear focus, and not be distracted by other, similarly interesting, digressions.

A personal highlight of my year was receiving the message that two of my articles had been accepted for publication in scientific journals, coincidentally on the same day. But there were other moments that could be labelled as highlights, such as performing a reading about my research to a group of extremely enthusiastic and motivated primary school children in the university museum.

The year 2013 will be very important for me, considering that I want to publish the results of my fieldwork in a number of scientific publications this year, and that these will eventually be used as important chapters in my thesis.'

i-PriSM – innovative pricing policy

This research project, led by Professor Erik Verhoef (VU Amsterdam), looks at innovative pricing systems that could contribute to sustainable mobility. The researchers review both road and rail transport, various technologies (cars that run on electric power versus conventional fuel), and various relevant groups (travellers and key stakeholders). They also study the interaction between infrastructure and urban networks. The implementation and transition phases are 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, the Knowledge Institute for Mobility Policy (KIM) and the NS.

First policy implications become clear

Ioannis Tikoudis at the VU Amsterdam has worked with others on the production of a first paper about the interaction between spatial planning within cities, urban labour markets and mobility streams. A model is now being developed for an area containing multiple cities, calibrated for the Randstad, with which the competition between cities with taxes and other policy instruments can be studied as can the interaction between pricing on the road and the railway. Tikoudis: 'In our first paper we emphasise three important issues for policy. Firstly an optimum pricing system in the transport system should reflect distortions in related markets, such as the labour market and the housing market, otherwise welfare effects can be negative. Secondly, welfare effects of pricing in transport are dependent on the way in which incomes are used. And thirdly, a differentiated road pricing system is a way to charge distance related taxes. That is desirable when the elasticity of the supply of labour varies in relation to distance between residence and work, and taxes on labour are used to generate government income.'

Collaborating parties deliver the best performing transport

In 2011 Erik-Sander Smits (Delft University of Technology) developed a theoretical framework with which he can estimate the effects of different innovative pricing measures on traffic, prosperity and the environment. Early on in 2012 he made a model that makes a connection between

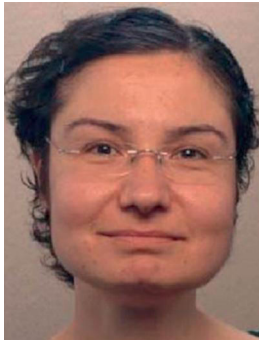
transport demand and supply on a small transport network, with which effects like delay and emissions can be determined. The two models together provide the possibility to judge pricing strategies. Smits: 'My most important task for 2012 was to include the preferences and interactions of various stakeholders in the development and evaluation of the tariff plan. I am referring to, for example, governments, public transport companies and environmental organisations. Suppose all parties were to work together instead of competing with each other. The model shows what the advantages of such a situation would be. To try this out I carried out a case study in which two pricing strategies are involved. The first was a road pricing system from the government. The second was a change in tariff by a railway company. The case studied showed that if the government and transporter work together, the transport system works better, and there are less delays. Later my model can be used as a tool to support decision making in the design and evaluation of pricing measures. In this way the impasse in negotiations between various current stakeholders might be overcome.'

Motivation necessary to believe information about pricing

In the autumn of 2012 Jan Willem Bolderdijk (University of Groningen), working in collaboration with other researchers within I-PriSM, developed and distributed a questionnaire to a representative sample of Dutch citizens. The people were asked, amongst other things, what they think or pricing measures. 'Data collection has now been completed. We will be carrying out analysis until the beginning of 2013.' To date the research consistently suggests that the attitude of motorists toward pricing regulations can be influenced by their underlying motivation to believe the information or not. Bolderdijk: 'People who expect financial benefits from pricing are quicker to appreciate and believe that pricing has beneficial social effects, such as decreasing congestion, than people who do not have this expectation. Therefore the simple communication of expected benefits to society, such as decreased congestion, does not necessarily lead to a greater acceptance if the end-users are not also motivated to believe information of this nature. Information about the advantages and disadvantages of pricing has more influence on people's attitudes when the information is related to values that they find important.'

Newspapers are still influential

PhD student Özgül Ardiç (Delft University of Technology) has been working on the question of the media's influence on the implementation of pricing. She has written numerous papers on the subject. To date analysis shows that the way in which newspapers write about a policy measure, such as road pricing, can to a certain extent have influence by jointly setting the terms for the political debate. (See also the interview with Özgül below.)



Researcher's perspective

Özgül Ardiç studies the opinions of stakeholders (politicians, interest groups) and the role of the media in the governing process.

‘Throughout 2012 I have paid particular attention to how the media behaved in the public debate concerning payment for mobility in the period of 1998-2010. I wanted to know how policy was presented in the media, which factors could

have caused possible changes in that, how objective the coverage was and what sort of positions were taken by the media if they weren't neutral. I analysed around 400 news articles, which was a gargantuan, difficult task. It took six months before I had a complete database, but I was all the happier when I saw the first graphs and figures! The whole data analysis was very satisfying; all that work paid off. At the end of 2012 I had finished writing up the findings.

As it turns out the Dutch media were not objective in the debate and could even be considered political actors. While all the major dailies were a bit biased in their reporting, the bias did vary: for example the Telegraaf was negative about pricing policy and the Volkskrant was positive. The media itself does not determine everything about reporting. It is also dependent on other political actors and their intrinsic message. Politicians cannot control reporting but they can influence it, in as much as they can control the political debate. So for a cabinet that wants to do anything with pricing policy it is important to get key figures on board and to provide the media with sufficient information, in order to increase the chance of positive coverage. But watch out! As a policy maker be careful with emphasising the advantages of the system. Media will be looking for balance and will not want to be accused of unbalanced – in this case too

positive – coverage. The media would also like to speculate about uncertainties in policy proposals: what will be the consequences? Overly complex messages will be shortened and simplified by the media. Loss of information can lead to misunderstandings. Bear in mind that measures that would affect a large number of people can expect a large amount of attention from the media. And finally, don't forget that the Netherlands has a long history of road pricing, so media attention is guaranteed for new proposals in this area. In the future I want to focus on the extent to which the media actually influences public opinion where pricing policy is concerned. I will be working with our colleagues in Groningen. After that I will be analysing policy documents and press releases to find out the opinions of politicians and interest groups concerning pricing policy.'

5 Four programmes first round nearly over

Passenger information, sustainable freight transport, networks of space and time and recreational traffic

The first four extended-term SAR research programmes started in 2008. These four programmes are now slowly coming to an end. The programmes focus on travel information, sustainable freight transport, synchronising time/space networks and recreational traffic.

TRISTAM – travel behaviour of the informed traveller

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. The user panel includes representatives from TomTom, the Knowledge Institute for Mobility Policy and ARS Traffic & Transport Technology. The programme is led by Professor Harry Timmermans (Eindhoven University of Technology).

Modelling route selection behaviour

PhD student Giselle de Moraes Ramos (Delft University of Technology) tried to get a better insight into the behaviour of travellers in relation to their route choice and journey times and the potential effect that travel information can have on this. In 2012 she has been working on the analysis of data from an experiment concerning commuting, in which the commuting behaviour of test subjects was recorded along with the extent to which they used travel information. Approximately 80% of the participants were given a TomTom device and were able to receive up-to-date travel information. De Moraes Ramos: 'Not only did I have to analyse the data from the test subjects but also the condition of the traffic network at the time they were travelling. Both the condition of the routes they had

chosen and the alternative routes they could have chosen were of concern. After that I worked on the modelling of route selection behaviour and its consequences for network dynamics. Furthermore, I have started my thesis and presented and submitted various papers.'

What choice of behaviour is caused by travel information?

PhD student Ruihua Zack Lu (Delft University of Technology) has performed an experiment with a journey simulator. Using the simulator he can collect data about choices made by travellers concerning the use of travel information and teleworking during risky time periods and in situations where punctuality is important. (See also the interview with Zack further on.)

Testing a model with real travellers

PhD student Zahra Parvaneh (Eindhoven University of Technology) has continued work on a model with which the effects of advanced ICT on dynamic activities and travel patterns can be determined. Parvaneh: 'Currently travel information is mostly descriptive in nature – 'There's a traffic jam on the A1'. However there is now a tendency towards a change from descriptive information to prescriptive information – 'You'd be better off taking the A2'. The goal is to persuade drivers to take a particular route. Information services will become more dynamic and come increasingly closer to accurately determining current events and predicted situations. Furthermore, the availability to all kinds of electronic devices, such as smart phones, makes it possible to give very context specific and personal advice to people, whereby even someone's personal preferences can be taken into account. As well as new technology we also need knowledge about how people make decisions and how their opinions change based on experience with travelling. The provision of travel information can also result in changes of opinion and behaviour, dependent on the type of information and its reliability. In my research I tested these issues with the model as basis. We employed test subjects who receive different kinds of travel information using smart phones. In phase 1 I made an inventory of their demographic information and weekly schedule. Phase 2 involved the provision of travel information to the test subjects for one day of the week and the observation of their behaviour that day. Phase 3 was a survey at the end of the day, in which the test subjects could give their verdict on the travel information. It's a smart and interactive web-based questionnaire -

the first of its kind! I then adjusted the model based on all this data about individual behaviour in the real world when provided with advanced travel information.'

Less congestion means a bigger city

PhD student Serbej Gubins (VU Amsterdam) has conducted theoretical research into how morning traffic jams and the cost of commuting are related to where people live in the city. He demonstrated that the introduction of time-varying road pricing results in growth of a cities catchment area. Gubins: 'To come to this conclusion I considered how much time people spend at home and in the car and how this changes as a result of road pricing. Because drivers do not have to sit in their cars for so long they would spend longer at home, and that would in turn lead to a desire amongst residents to live in a larger house. Intuitively, if other factors remain constant, it would be reasonable to assume that the larger a person's house is, the more they benefit from time spent in that house. When a driver spends more time at home in the morning, he or she experiences stronger impulses to have a larger house. Although this effect may be relatively small at the individual level, it could well be noticeable for a whole city in the long term. This finding is in agreement with earlier studies that suggest that better transport in the city eventually leads to city expansion.'



Researcher's perspective

Ruihua Zack Lu studies the effect of ICT on accessibility.

'I focus on the effects of ICT on the accessibility of urban regions. In the past year I have primarily been occupied with the collection and analysis of empirical data. The data originate from an experiment with a travel simulator. In this experiment people chose to travel via a certain route or set of routes or to engage in teleworking instead of travelling.

They did this under conditions of uncertain travel times and close-shave arrival times. In some cases the participants also had the option to buy travel information prior to making a choice and in other cases they did not.

After a test period in 2011 I carried out the experiment with 271 participants in March and April of 2012. The model appeared to work well. Using a supplementary survey I have managed to determine the correlations between teleworking and travel information and the effects of other possible factors on traveller's preferences in this area.

Data collection and the analysis thereof was a success. I enjoyed the whole process – especially the moments when the data analysis really led to results. The research project is also very policy-relevant. Firstly, it delivers an approach for measuring and assessing effects of travel information and tele-activities on accessibility, while including the possible interactions between the two. Secondly, our results show that there is a possibility of synergy effects on accessibility from travel information combined with tele-activities. That is to say: if people can both use travel information and choose tele-activities – teleworking, teleshopping and so forth – then that reinforces accessibility.

For me the hardest part of the research was data collection. How do you gather enough data to realise your research objectives while staying within a limited budget? That whole process was a challenge. It was challenging, from a scientific perspective, to design and implement the simulator experiment and the survey, and from a practical perspective, to complete the whole process with a limited budget. The second aspect of the work that I find difficult is yet to come: how can you derive practical and policy-relevant insights from all the scientific research that has already been done?

In 2013 I will mainly be focussing on writing my thesis. It is certainly challenging to write up all the research activities and research results in a well structured and communicable way.'

Sustainable freight transport

The researchers working on 'Towards a sustainable multimodal freight transport system for the Randstad', the programme led by Professor Lori Tavasszy (Delft University of Technology and TNO), focus 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 Tavasszys freight transport programme, including people from the Knowledge Institute for Mobility

Policy (KIM), the Central Bureau of Statistics Netherlands (CBS), TNO and the Rotterdam Port Authority.

From links to chains

In 2012, Post-doctoral researcher Maureen Lankhuizen (VU University of Amsterdam) finalised data sets associated with national and international trade flows in the Netherlands at a regional level. For her project she worked in close association with CBS, who are currently working on integrating her figures, in euros and net weight, with their own transport statistics. The integration of statistical data about freight transport will give both science and policy makers more insight into freight flow to, from and within the Netherlands. Where stand-alone transport statistics represent only links in the chain, Lankhuizen joins the links together to make coherent chains.

Model that supports choices for distribution, transit and storage

PhD student Igor Davydenko (TNO and Delft University of Technology) has developed a combined gravity and logistics choice model. This model can both accurately reproduce regional distribution and warehouse throughput, and predict inter-regional freight flows. The model was empirically tested with the help of unique road transport research data from the CBS. The logistics chain choice-model links trade in physical goods and freight flows, through which it becomes possible to perform a detailed analysis of logistics policy measures and regional appeal for distribution and storage facilities.

Model that helps policy makers to optimise the transport network

PhD student Mo Zhang (Delft University of Technology) has applied the model, developed in 2011, to two case studies. Using this model Dutch container transport can be optimised further with regards to sustainability. (See also the interview with Mo further on.)

Actors in urban freight transport

Research done by PhD student Niles Anand (Delft University of Technology) is focused on the development of a multi-actor model for urban freight transport. His literature study revealed shortcomings in models used in the area of interaction between heterogeneous stakeholders. Anand: 'Insight into the interactions between stakeholders regarding freight transport can help with the implementation of policy measures to create sustainable cities. The first step was the development of a standard information model for the domain of freight transport. I used that model to make an actor oriented model for the city of Rotterdam with which I tested the implementation of various policy scenarios. Now that I am nearing the end of my research project I plan to develop a validation game for the model. This could be used as a simple aid to help understand how complex urban freight transport can arise from simple interactions between stakeholders.'



Researcher's perspective

Mo Zhang developed a model in which public and private decisions in the development of multimodal networks were combined.

'In the course of the last year I have worked on the optimisation of the transport network for a sustainable multimodal freight transport system. The network consists of roads, railways, inland shipping routes and the network of

terminals on the European scale. Transshipment and pre and post-transport are also part of the network.

Optimisation of the network relies as much on infrastructure and service provision as on policy. The transition to sustainability can be made using CO₂ pricing and by creating new transfer opportunities, within the limits of what is commercially viable. You could call this a first approach to making a sustainable synchro-modal network design. The model we developed in 2011 has been applied to two case studies. One of them involved transport inland via waterways. Our goal was to get an insight into how pricing policy and networks of terminals and services can be designed to meet a certain demand for

container transport – in terms of size and composition of the freight. In the other case study we used the model to predict the capacity for processing deficits or surpluses in Dutch container terminals in scenarios for the years 2020 and 2040. Both cases have contributed to the implementation of the Rijkswaterstaat's IDVV-programme. IDVV stands for “Impuls Dynamisch Verkeersmanagement Vaarwegen” meaning Impulse Dynamic Traffic Management for Inland Waterways.

It was very satisfying to get more insight into how Dutch container transport works and how we could improve the performance of the transport network. We developed an integral design model for the freight transport network that is now being validated with historical data about real-world container transport in the Netherlands. The model is composed of databases of transport demand, characteristics of the transport network, information about service provision, transport and transshipment costs, emissions and external costs. The results can be visualised per transport method and per resource group, on a GIS map, and all that at different levels: market sectors, terminal level, corridor level, regional, national and network level.

It is particularly difficult to represent and simulate such an enormous and complicated transport network in a reasonable and controlled way in a model.

We are dealing with a very heterogeneous network with many different actors, a huge diversity in transport demand, a large diversity in the provision of transport services and so forth. So we are concerned with a large scale, with multimodality, with various resource types, with many different actors and all sorts of different combinations of them. The combinations are particularly challenging if you want to make a decision support model. There is also no fixed vision of the future for an optimal transport network. The future is dependent on many factors. For example, there has recently been a sharp rise in the amount of freight transport by sea. Furthermore, the demand for intermodal transport capacity is not solely dependent on economic growth. The configuration of terminal networks also has an effect. Meanwhile the networks have to adjust themselves to changes in geographical flow patterns and in resource types.

In 2013 I will write up my thesis and look for more applications for our model.'

Supernetworks of activities, space and time

The researchers working on 'Synchronizing Networks' are developing a supernetwork in which transport systems, spatial planning and activity patterns are viewed as an interrelated whole in time, space and virtual space. This will help designers and planners of spatial facilities, mobility and infrastructure to acquire a better understanding of traveller's behavioural patterns. There is an active user group involving Travel Information Group 9292, Dutch Cyclists Association (Fietzersbond), NS, Knowledge Institute for Mobility Policy (KIM), the municipality of Rotterdam and the Ministry of Infrastructure and the Environment. Dr. Eric Molin (Delft University of Technology) is leading the programme.

Supernetwork model continues to be extended

PhD student Feixiong Liao (Eindhoven University of Technology) is responsible for the modelling project. He has developed the 'supernetwork model' further. Liao: 'The model's application is to address a number of planning issues concerning Park+Ride locations in Rotterdam. I've also used it to analyse the effects of the introduction of electric bicycles. The model has also been extended with several fundamental elements: social activities for example. Furthermore, it can now take into account time-window limitations and other time dependent factors in the choice of journeys and activities. Choice experiments have been carried out to determine parameters for preference and these have now been incorporated into the model. Lastly, a large-scale data collection effort using GPS has started in the Randstad. We want to know which activities and journeys people undertake over the course of several weeks, so that we can further test and refine the model. I have presented numerous papers at a variety of conferences.'

Model tested with 200 volunteers

PhD student Chao Chen (Delft University of Technology) is carrying out the project concerning the use of the supernetwork model. In this project data are collected via a specially developed laboratory experiment. In this experiment the complexity of choices to be made and the time given to respondents to make their choice are varied. Using this experiment researchers can discover what effects complexity has on making choices and

on choosing while subject to a time limit. (See also the interview with Chao further on.)

Steering and coordination of spatial policy processes

PhD student Sara Levy (Radboud University Nijmegen) is working on the Governance Project. She has developed two models. Levy: 'I have developed one of the models to simulate the impact of (the lack of) coordination between local authorities, such as municipalities, on land use and transport. The other model simulates the effects of three governance archetypes (hierarchical governance, market forces and network governance) on land use. I have also done literature research on the subject of the use of agent-based modelling when simulating governance processes and coordination strategies. I have also laid the foundations for another model, that will be used to simulate the coordination between actors in spatial planning and actors in mobility.'

Policy measures in a nutshell

Postdoctoral researcher Wendy Bohte (Delft University of Technology) has left the project and is succeeded by Jan-Willem van der Pas. He is responsible for the design project within Synchronizing Networks. He will mostly be working on the application of the supernetwork model that has been developed by Feixiong Liao for a case study in the Rotterdam - The Hague corridor. Van der Pas will be developing integrating transport-spatial scenarios to be calculated within the supernetwork model, especially with regards to their effect on travel behaviour. With this it will be possible to answer more questions about transit oriented development. Van der Pas: 'An example of such a question would be to what extent do people use more public and multimodal transport as spatial developments become concentrated around transport hubs, such as around intercity stations, compared to lack of such spatial concentrations.'



Researcher's perspective

Chao Chen studies people's behaviour, preferences and perceptions when performing their daily activities.

'In the past year I have been working on the question to what extent the complexity of choice of routes and time limitations influence traveller's choices for specific journeys. What is meant by complexity is that the making of some choices is easy, such as planning a drive to a shop, and that other

drives can be more complicated. Consider the making of choices for the activity pattern of a whole day involving many destinations. Carrying out the laboratory experiment was a lot of fun. We worked with a travel simulator on the computer. 200 participants were involved, the majority of whom are involved in daily commuting. It was a success! Using the collected data as a basis we have proved that complexity and time limitation have a noticeable effect on the choices travellers make. This means that it is important to include these effects in the choice model considering that otherwise you would get compromised results for, for example, the value people assign to saved time. For example, if a traveller has to make decisions under a time limit or when the choice is complex then there is more 'noise' in the choice process, that can lead to more arbitrary and often sub-optimal choices. This seems obvious, but the explicit inclusion of this phenomenon in a mobility model is new. The results of the experiment were presented at an international conference.

By the way, the coordination of the development of the travel simulator and the implementation of the laboratory experiment was very time consuming. In 2013 my most important task will be writing my thesis.'

Recreational transport behaviour

The researchers working within 'The value of recreation' programme, led by Professor Bert van Wee, 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 radically changing conditions, such as the rising demand for recreation, and the consequences of climate change and climate change policy into account. The user panel associated with the programme includes representatives from the Ministry of Infrastructure and

the Environment, the Knowledge Institute for Mobility Policy (KIM), the Ministry of Economic Affairs, and InnovationNetwork/STIRR.

The car remains dominant for recreation

Tom Gosens (VU Amsterdam) focuses on the economic value of recreation and applies the most recent econometric techniques. 'I don't just look at consumer preferences for specific activities, but also the value assigned to recreative locations and transport choices are covered. Furthermore, all these aspects are related to the residential location of the consumer, meaning that the effect of accessibility takes centre stage,' says Gosens. 'My research shows that the consumer is limited in her choices by time availability. But even when time restrictions are less stringent, the willingness to travel for, for example, outdoor leisure is limited. With this kind of activity there is a preference among consumers for a large and diverse landscape, and the presence of cultural and historic elements in the outdoor area are also appreciated. A positive effect of cultural heritage is also noticeable in the choice of a destination for another category of trip, namely recreational shopping. However, characteristics of the consumer will influence the extent to which these effects are relevant. Finally, it appears that the car remains dominant with regards to recreational activities, even in the most built-up areas of the country. Although the type of activity, the start and finish time of the recreational activity and of course the travel duration play an implicit role in the consumer's choice, car ownership is often a sufficient reason to choose for car travel.'

Choices depend on time, budget, age and household composition

PhD student Anna Grigolon (Eindhoven University of Technology) wrote her thesis in 2012 and hopes to gain her PhD in 2013. Her research results suggest that the differences in behaviour during holidays and free-time given individual life-cycle stage can generally be explained by the flexibility or limitations typical for each group. The most important factors are time and budget and factors that concern age and household composition. (See also the interview with Anna further on.)

Rather a shorter holiday closer by than no holiday

PhD student Sander van Cranenburgh (Delft University of Technology) conducts research into the effects of a substantial increase in travel costs on holiday behaviour. In the future various scenarios are possible in which substantially higher travel costs become a reality; for example as a result of the depletion of fossil fuels, or as a result of the introduction of CO₂ taxes or flight taxes. For this research he has conducted a choice experiment and a survey amongst holidaymakers. Van Cranenburgh: 'Results show that holidaymakers are more inclined to adjust their holiday plans than to take no holiday at all. The number of short domestic holidays increases. As a result of strong interactions between transport method, the accommodation and the destination involved in holiday choice, a substantial increase of travel costs does not only impact the transport side of the tourism sector but affects the sector as a whole.'

Bicycle commuting and recreational cycling are mutually reinforcing

In 2012 postdoctoral researcher Maarten Kroesen (Delft University of Technology) worked with Professor Susan Handy from California (USA). Kroesen: 'The collaboration is centred on the question of the extent to which recreational bicycle use is related to the use of a bicycle for commuting. Based on previously collected panel data we have shown that both forms of bicycle use have a reciprocal influence on each other in a positive way over time. This means that work-related factors, such as distance to work and whether or not one receives a travel allowance, do not only influence bicycle use for commuting but also indirectly affect recreational bicycle use. So if cycling to work can be made more attractive, then this effect would continue to work in favour of the use of a bicycle for travel unrelated to work. Furthermore, we have seen that people who use a bicycle for both commuting and recreational purposes are more stable in their choice of transport and are less likely to be influenced by structural changes, such as an increase in the distance to work, than people who only use their bicycle for work and not for other purposes.'



Researcher's perspective

Anna Grigolon studies the dynamics of recreation in time and space in the current context.

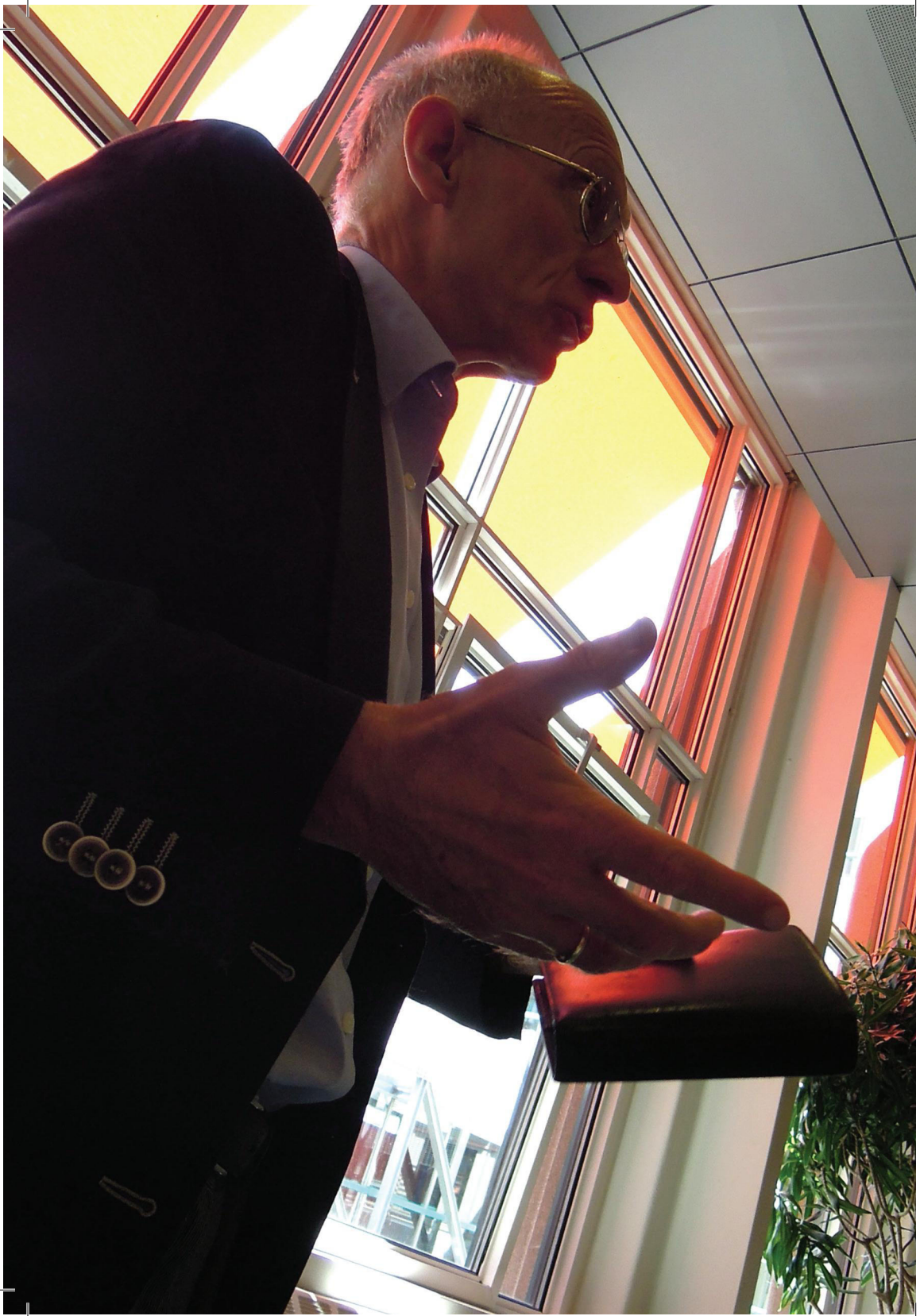
'In 2012 I wrote my thesis. It is a compilation of a number of analyses that I have carried out based on four data sources. I have been able to get a better insight into the formation of the recreational agendas of households and into the dynamics of specific facets of recreational behaviour as a function of life cycle, while controlling for other facets. Facets like the destination and the transport method are strongly dependent on each other. For this reason it is important to retain this concept of 'portfolio choice' when studying people's choices concerning recreation. Incidentally, for the purposes of my research the term recreation includes both holidays (tourism) and leisure activities outside the house.

It was very nice to see how my thesis was received, as well as the total result of the PhD project: the publication of six papers in scientific journals (*Journal of Air Transport Management*, *European Journal of Tourism Research*, *Journal of Travel Research*, *Journal of the Transportation Research Board*), two papers about tourism management and a number of conference papers.

The research results suggest that the differences in behaviour during holidays and free-time given individual life-cycle stage can generally be explained by the flexibility or limitations typical for each group. The most important factors are time and budget and factors that concern age and household composition.

I found the most challenging part of the research to be the gathering of data, and subsequently trying to understand them and translate them into models that would give an interesting and, most importantly, a realistic vision of the phenomena that I wanted to research. In the process from 'raw data' to the model's last output there are various steps and decisions that must be made, and each of them requires a lot of discussion and strategic consideration.

In May I will be defending my thesis. And what then? There are a few open positions in my area of specialisation at universities where I could broaden my academic career. In addition, the idea of focussing my attention on the private sector is also tempting. I don't know yet. Luckily I have the time to consider things and to make sure I make the right decision.'



6 Impression of the Young Scientists meeting in June

Just like in 2011 a meeting took place in 2012 between young researchers and policy makers at the Ministry of Infrastructure and the Environment in The Hague. This time the topics for discussion were Strategic Knowledge and Innovation Agenda of the ministry and the research themes travel information, climate in relation to transport and spatial planning, the planning of infrastructure with various objectives and the introduction of electric transport.

PhD students and post-doctoral researchers from the SAR programme were present on the day, but also several interested researchers from the NWO programme Energy Transitions and SAR's VerDuS programme Urban Regions in the Delta.

SKIA themes well received

Firstly the gathered researchers received an introduction from Jos Voeten, employee of the ministry's directive Knowledge Innovation and Strategy, concerning the SKIA 2012-2016 (Strategic Knowledge and Innovation Agenda). This includes seven themes:

- The energetic society, governance and decentralisation:
What are the possibilities of working with and making use of the 'energetic society' in the context of the challenge for society?
- Funding, business models and other market approaches:
What are possible new forms of funding for the infrastructure and environment policy domain.
- Individualisation and behaviour:
In what way do the preferences and behaviour of individual citizens and businesses affect the reaching of Infrastructure and Environment's societal goals and how can I&E deal with this.
- Spatial development:
How can we at I&E, using a smart, safe and efficient organisation of space, support the desired metropolitan business environment and support a smart combination of red, green and blue functions throughout the country, while taking climate change into account?

- Hubs and Networks:
How can we support the accessibility of our key economic areas with the deployment of transit oriented development and multi- and synchromodality?
- Sustainable mobility:
How can we fulfil our future mobility and logistical needs in a way that optimally supports prosperity, stays within ecological limits (climate, biodiversity) and supports the quality of the living environment (noise, safety, air quality)?
- Forming energy, resource and water chains:
What possibilities are there for 'greening' the economy and who must do what when?

The various research programmes and projects of SAR, Energy Transitions and Urban Regions in the Delta deal with these themes and issues well.



How do travellers behave? Influence of travel information and climate

Next there was a walk-in lunch and the afternoon session 'Science Sandwich' was opened by Petrouschka Werther, manager of the department of Automobile Emissions and Fuels of the Ministry of Infrastructure and the Environment. Four young scientists presented their work. Zahra Parveneh (Eindhoven University of Technology) spoke about advanced forms of travel information for travellers and simulations she carries out with them. After that Peter Pelzer (Utrecht University and Radboud University Nijmegen) spoke about the CESAR programme in which the relationship between climatological processes, urban spatial configurations and people's transport choices are analysed. The findings could be, amongst other things, used for future spatial planning processes. Initial conclusions are that climate change will certainly influence people's future transport choices; there will be more cycling. Spatial planners could already be taking that into account by strengthening the bicycle infrastructure. Adjustments in city building also need attention with regards to expected increases in summer temperatures, according to Pelzer.

Achieving multiple goals simultaneously

Next it was Ties Brands' (University of Twente) turn. He spoke about the SRMT programme and the design of so-called 'multi-objective, multimodal networks': transport networks made up of different transport modalities developed so that various objectives (accessibility, lower CO₂ emissions) can be reached simultaneously. The researchers have experimented with a model for this in the Amsterdam-Haarlem area. Objectives here were, for example, a minimisation of travel time and minimum use of government money for public transport connections. Of the 26 options for measures a few were revealed that would be the most optimal considering these objectives.

Motives for and against the purchase of the electric car

Lastly Will Sierzchula (Delft University of Technology) spoke about the introduction of the electric car. He is associated with the Energy Transitions programme concerning electric transport, the researchers of which work closely with the SAR researchers who are likewise working on electric transport. Research amongst drivers about motives to drive an electric car

has shown that the symbolic and environmental value of electric transport is very important for them. The greater instrumental value of the electric car seems to be less important. Motives to avoid acquiring an electric car are the high purchase price, the time and trouble of charging, the limited operating range and several other aspects such as a lower top speed and smaller baggage space.

The attending policy makers were pleased with the presentations. They found a lot of the presented material to be surprisingly policy-relevant.



7 Impression of the VerDuS-conference in November

On Monday 19th November 2012 the first large conference for Connecting Sustainable Cities took place in the Beurs van Berlage in Amsterdam. The theme was 'New arrangements in a horizontal world'. More than 200 participants gathered in the Beurs van Berlage in Amsterdam for stories and exchanges between researchers and experts.

Siebe Riedstra, Secretary-General, Dutch Ministry of Infrastructure and the Environment and member of the VerDuS Supervisory Board opened the conference. He emphasised the importance of continuous contact between researchers and people working on policy or in the field. From the Strategic Knowledge and Innovation Agenda of the ministry he expressed wishes that new solutions for governance be developed from that contact. The old no longer work in the energetic society.

Josephine Green, visionary and historian followed with the key note speech. We are in the middle of a paradigm shift: the industrial paradigm is financially, operationally and morally bankrupt, according to Green. In other words: all roles will irreversibly change, including those of politicians and researchers. 'It will no longer be about what, but about who and how,' Green told her audience. Green, the former Senior Director of Trends and Strategy at Philips, described how the current socio-economic model has a pyramid shape: everyone wants to be at the top, where there is only room for a few people. 'In this way the intelligence and creativity of many people are left unused.' It is a model based on scarcity, competition and control. She pleaded for a new shape: the pancake, in which people can easily work together and freely exchange creativity thanks to its flat shape.

From economy to ecology

In this way you move from the idea of scarcity to one of abundance. Innovation must also be decentralised and no longer centred at the top. After all, the solution lies with the people that it concerns, and they are everywhere. The problem is that at the moment the predominant vocabulary is still traditional: words like control, budgeting and efficient

organisation do not rhyme with concepts like risk, discovery and endeavour. Still, this switch from 'economies of scale' to 'ecologies of scale' is sorely needed: 'This is not a question of 'nice', but a necessity if we want to conserve the human race.'

Luckily, Green continued, we are also a species that knows that things like cooperation, reciprocity and love are especially good at supporting our survival. 'Yes, those are scary words, because they sound rather soft and feminine,' Green remarked. 'But still, they are at the basis of the radical and revolutionary effort to make our society more sustainable and all the processes involved. There is little soft about it.' Her closing statement, a Peter Drucker quote, left little to the imagination: 'The greatest danger in times of turbulence is not the turbulence; it is to act with yesterday's logic.'

Eight sessions

After the key-note speech the chairman of the day Wim Hafkamp outlined the agenda for the sessions in two rounds. These were arranged into four 'tracks'. In the track 'Towards a sustainable delta' there were presentations from researchers in the programme Urban Regions in the Delta. Transit oriented development (TOD) was included in the track 'Innovations for the integration of space and mobility'. In the first session there were TOD lessons from abroad during presentations by the experts Wendy Tan (University of Amsterdam), Paul Chorus (Province of North Holland) and Sander Lenferink (Radboud University Nijmegen). Examples of Tokyo and Portland, amongst others, were presented. In the second round the participants reflected on Dutch TOD practice. Cor Hartogs of the Arnhem-Nijmegen metropolitan area presented the case study for Zevenaar-Oost; Herman Gelissen (StedenbaanPlus) talked about StedenbaanPlus. A panel of scientists gave feedback.

In the track 'Social and economic problems for the city' knowledge from the VerDuS programme 'Kennis voor Krachtige Steden' (Knowledge for Strong Cities), concerning new migrant workers from middle and eastern Europe and quality of life in residential areas, was presented.

The fourth track 'Sustainable mobility and transport' was again based on SAR research. Professor Bert van Wee (Delft University of Technology) presented several initial, important results and answered questions from

the audience on behalf of the ten somewhat longer-term university research teams. Afterwards the participants got to work on three themes to apply their knowledge. Sustainable freight transport and logistics was a central theme in the second round.

Excellent knowledge transfer

Back in the plenary hall the short film by VerDuS researcher Niek Mouter (Delft University of Technology) was shown as an example of accessible knowledge transfer. His research concerns, amongst other things, the value assigned to the social cost-benefit analysis by economists and spatial experts. His research also concerns possible techniques to limit fundamental problems, better exploit advantages and minimise disadvantages. In this study it became clear that key players in the Dutch MKBA sector think that 'the estimation of non-monetised project effects', 'the monetisation of project effects' and 'the creation of a problem analysis' are the most important intrinsic MKBA problems.

The Netherlands a model country?

Afterwards Wim Hafkamp, Josephine Green, Hans Leeflang (the Director of Knowledge, Innovation and Strategy of the Ministry of Infrastructure and the Environment and chairman of the SAR programme commission) and the (twitterers in the) audience conducted the most important outcome of the day. Green proposed that the Netherlands has the potential to be a model country when it comes to new, horizontal ways of collaborating. 'But too much is still thought about and done the old-fashioned way,' she warned. Wim Hafkamp proceeded to quote a number of tweets that seemed to agree. 'If we really want to have creative solutions to, for example, mobility issues, we have to work more closely with the end user,' according to one twitter user in the audience. Green: 'Especially in developmental science this is possible.' Paul Gerritsen from the Deltametropool Association responded: 'We have already been working on new ways to deal with spatial processes for some time. Change is genuinely on the way. We are definitely in need of public opinion for co-creation.' Green also realises that not everything can be achieved with co-creation and self-organisation. 'We also need inspiring leadership. And people who can teach others who are not as good at self-organisation that they can do it.'

Hans Leeftang also gave several opinions. 'I've noticed that we need a new language and new stories. I have seen the beginnings of this today. For example, in the session concerning large rivers and the one about sustainable logistics. I have also noticed that we still view the government too much in old terms. We are still stuck in the repertoire of New Public Management. We do not need more or less government concerning urban regional governance issues, but a different kind of government. There is a need for new practices.'

Lastly drinks and snacks were served.

During this conference interactive, live coverage was used for the first time.

All impressions, presentations, photos and films can be seen at:

<http://www.dialog.verdus.nl>



8 Who's who in SAR?



Synchronising 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 (until October)/Jan-Willem van der Pas, j.w.g.m.vanderpas@tudelft.nl, supervisor Eric Molin, e.j.e.molin@tudelft.nl



TRISTAM: Traveller Response and Information Service Technology

Programme leader: **Professor 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 Zahra 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: **Professor Bert van Wee**,
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- **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 Maarten Kroesen, m.kroesen@tudelft.nl, supervisor Bert van Wee, g.p.vanwee@tudelft.nl



Towards a sustainable multimodal freight transport system for the Randstad

Programme leader: **Professor Lóri Tavasszy**,
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- **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



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

Programme leader: **Professor Martin Dijst**,
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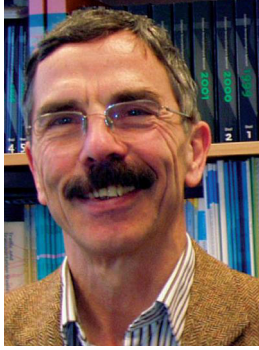
- **Impact of climate change on mobility and residential choices**, PhD student Lars Böcker, bocker@geo.uu.nl, supervisor Martin Dijst, m.dijst@geog.uu.nl
- **Developing and evaluation of a modelling framework for urban weather and climate studies**, PhD student Natalie Theeuwes, supervisor Bert Holtslag, bert.holtslag@wur.nl
- **Improving integration of expert with tacit knowledge for strategic planning Processes**, post-doctoral researcher Marco te Brömmelstroet, m.c.g.tebrommelstroet@uva.nl, supervisor Luca Bertolini, L.Bertolini@uva.nl
- **Urban Strategy climate proof**, PhD student Peter Pelzer, p.pelzer@uu.nl, project leader Stan Geertman, s.geertman@geo.uu.nl



i-PriSM: Innovative Pricing for Sustainable Mobility

Programme leader: **Professor Erik Verhoef**,
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- **Implementation of transport pricing: an economic perspective**, PhD student Ioannis Tikoudis, i.tikoudis@vu.nl, and postdoctoral researchers 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, supervisor Linda Steg, l.steg@ppsw.rug
- **Implementation of road pricing: Vehicle technology, governance, and institutional transition**, PhD student Özgül 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: **Professor Ingo Hansen**,
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- **Spatial economic analysis of multimodal transport systems**, PhD student Yuval Kantor, ykantor@feweb.vu.nl, supervisor Piet Rietveld, p.rietveld@vu.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 multimodal 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



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

Project leader: **Professor Bert van Wee**,
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- **Economic and psychological aspects of the introduction of electrical vehicles**, post-doctoral researcher Marija Bockarjova, mbockarjova@feweb.vu.nl, supervisor Piet Rietveld, p.rietveld@vu.nl
- **An institutional and managerial scientific perspective on the transition to electric vehicles**, Sjoerd Bakker, s.bakker-1@tudelft.nl, supervisor Bert van Wee, g.p.vanwee@tudelft.nl



Mobility management and climate change

Project leader: **Professor Jos van Ommeren**,
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– **Public Policy and Firm Mobility Management: Implications for Climate Outcomes**,

post-doctoral researcher Eva Gutiérrez-i-Puigarnau, e.gutierrezpuigarnau@vu.nl, supervisors Jos van Ommeren, jommeren@feweb.vu.nl, and Piet Rietveld, p.rietveld@vu.nl

- **Mobility Management and Space-Time Patterns: Implications for Climate Outcomes**, post-doctoral researcher Linda Nijland, e.w.l.nijland@uu.nl, supervisor Martin Dijst, m.dijst@geog.uu.nl



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

Project leader: **Professor Geert Dewulf**,
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- **Impact of climate change on infrastructure networks**, post-doctoral researcher Herbert ter Maat, Herbert.termaat@wur.nl, supervisor Pavel Kabat, pavel.kabat@wur.nl

- **Implications of climate change for maintenance policy**, post-doctoral researcher Irina Stipanovic, I.Stipanovic@utwente.nl, supervisor Geert Dewulf, G.P.M.R.Dewulf@ctw.utwente.nl



Implementing Transit Oriented Development (TOD)

Programme leader: **Professor Luca Bertolini**,
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- **Project 2**, PhD student Sander Lenferink, s.lenferink@fm.ru.nl, supervisor Erwin van der Krabben, e.vanderkrabben@fm.ru.nl
- **Project 3**, Dorina Pajani, d.pojani@tudelft.nl, and Verena Balz, v.e.balz@tudelft.nl, supervisor Dominic Stead, d.stead@otb.tudelft.nl



Transit Oriented Development in the Randstad Southwing

Programme leader **Dr. Karst Geurs**,
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- **Linking station accessibility to regional accessibility in the Randstad Southwing**, Lissy La Paix Puello, l.c.lapaixpuello@utwente.nl, supervisor Karst Geurs, k.t.geurs@utwente.nl
- **The economics of TOD in the Randstad Southwing**, Hans Koster, h.koster@vu.nl, Martijn Dröes, m.droes@vu.nl, supervisor Piet Rietveld, p.rietveld@vu.nl
- **Market perspectives for TOD in the Randstad Southwing and lessons from international experiences**, Christa Hubers, c.g.t.m.hubers@tudelft.nl, supervisor Kees Maat, c.maar@tudelft.nl



Understanding social and spatial dynamics in bicycle use in the Randstad and its policy implications

Project leaders: **Professor Luca Bertolini**,
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Implementation by post-doctoral researcher Lucas Harms,
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The role of the bicycle as an egress and access mode for multimodal nodes

Project leader: **Professor G. de Roo**, g.de.roo@rug.nl

Implementation by post-doctoral researcher Eva Heinen,
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9 The management structure of the SAR programme

The SAR programme is part of the research theme: Connecting Sustainable Cities (Verbinden van Duurzame Steden or VerDuS). The SAR programme has a Supervisory Board. The SAR programme itself is directed by a Programme Committee. The Programme Committee is responsible for the coordination and coherence of the programme, assesses 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 Committees advice and oversees the implementation of the research programme.

At the end of 2012, the composition of the various bodies involved in the SAR programme was as follows.

Supervisory Board for Connecting Sustainable Cities (Verbinden van Duurzame Steden or VerDuS)

S. Riedstra, Ministry of Infrastructure and the Environment, chairman
Mrs. A. M. Burger, Ministry of Economic Affairs
P.J.M. van Laarhoven, Schiphol Group
M. Frequin, Ministry of the Interior and Kingdom Relations/Housing, Communities and Integration (BZK/WWI)
P.G.A. Noordanus, Major cities
P. Hooimeijer, for NWO

Programme Committee

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

Government representatives

N. van Paridon, Amsterdam Metropolitan Region
J. Haver, Dutch Ministry of Infrastructure and the Environment
J. van der Waard, Netherlands Knowledge Institute for Transport Policy
Analyses
Vacancy, Ministry of Economic Affairs

Scientific representatives

A.N. Bleijenberg, TNO
P.P.J. Driessen, Utrecht University
Mrs. M.A.J. Linde, TNO
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 and Behavioural Sciences
Mrs. C. van der Poel - van Leeuwen, NWO Social and Behavioural Sciences

Communication

Mrs. Y.M. de Boer, YM de Boer Advies v.o.f.







