

TPM QUARTERLY

FACULTY OF TECHNOLOGY, POLICY AND MANAGEMENT

Traffic and transport: forging ahead into the future

Will we all have our own aeroplane in 40 years' time? Will we be able to travel as passengers in cars that steer themselves? According to Prof. Bert van Wee, leader of the Transport Policy and Logistics Organisation (TLO) section at TPM, it won't come to that. "But: traffic and transport are evolving apace."

Van Wee came to the field of transport purely by chance. "Originally I trained as a social geographer, but when I graduated in 1983 there weren't many job opportunities. I went to do field-work for a traffic-engineering research bureau, which involved counting vehicles and performing measurements, among other things. The scope of my work gradually widened, and I led research projects and took courses. That's actually how I came to be working in this discipline."

He is fascinated by traffic and transport for a number of reasons. "It's something that affects everyone, and I'm a consumer/user too. As a geographer, what interests me is the fact that traffic connects places with each other. Without transport, everything is at a standstill; we can't do without it. I'm also interested in long-term issues, and there are plenty of those. Projects involving the construction of airports or railway lines, for example, take many years."

Another factor is the enormous social importance of the subject area. "In the Netherlands we spend about 15 percent of our income on transport. Traffic and transport are also important in terms of environmental load. Safety is an important issue too: every year, 800 people die in traffic accidents in the Netherlands. And then there is the matter of traffic congestion; traffic jams attract a lot of media attention and are a real issue for people. The social impact is enormous. These issues affect everyone, so everyone is interested in what we do here."

Wealth of studies

TLO produces a wealth of studies on a wide range of subjects. Some PhD students research new technologies such as intelligent speed-adaptation systems, while others focus on noise pollution in the aviation sector in terms of how it is perceived by communities, rather than the number of decibels. We have a PhD student who is studying the policy-making process relating to Schiphol. Research is also being carried out into budget over-runs in major infrastructure projects, and the reasons for that.

Van Wee has more to add to the list: "We've just appointed a member of staff to research the success factors for large-scale infrastructure projects. We still have a vacancy for someone to study technical innovations in the transport sector. Other areas of focus are noise pollution caused by traffic, the choice processes for all manner of technology projects, and the evaluation of all manner of completely different projects for the future, from dredging to road-building. All areas of research are equally important and I don't want to leave anyone out, but there are too many to mention."

One thing is clear: traffic and transport is a multidisciplinary field, and that fascinates Van Wee too. "You can look at it from all sorts of perspectives: civil engineering, economics, psychology, spatial planning, and even philosophy. To solve complex issues you have

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Guus Berkhout Officer of the Order of Orange- Nassau

Prof. Guus Berkhout is the proud recipient of the Dutch Royal Honour of Officer of the Order of Orange-Nassau, which was presented to him in The Hague by Mayor Jozias van Aartsen. Prof. Berkhout was a full professor and administrator at TU Delft, for more than thirty years, before taking his leave on 8 June 2007.



Guus Berkhout began his career in 1964 working for Shell, during which time he held various international posts in the field of R&D and technology transfer. In 1976, he was appointed full professor of Acoustic Imaging and Sound Control at TU Delft. Between 1998 and 2001, he was a member of the Executive Board with the prime responsibility of overseeing the Research portfolio and in 2001, he accepted the chair in Innovation Management. Berkhout has written hundreds of academic articles and a number of books on various aspects of acoustics, geophysics and innovation and has supervised more than fifty PhD students throughout his career.

For the past 25 years, in addition to his professorial duties, Berkhout has been programme director of the Delphi scientific research consortium, which he also founded. TU Delft is one of the consortium's partners and is currently developing a knowledge base of seismic measuring methods for approximately thirty oil and gas companies. He is also one of the co-founders of the European Centre for Innovation (ECI) and a member of the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Netherlands Academy of Technology and Innovation (AT&I).

Berkhout plans to continue with a number of his current activities, namely supervising various PhD students, managing the Delphi consortium and conducting scientific research in his specialist fields of acoustics, geophysics and innovation management.

IPSE takes part in GAPEM

The Institute for Public Sector Efficiency Studies (IPSE) is to participate in the 'Group for Analysis of Performance in Economics and Management (GAPEM)'. This European network is concerned with the wide application of performance benchmarking. IPSE Studies will be responsible for the Dutch branch of the network. Its tasks will initially involve organising mini congresses, contributing to each other's projects and possibly participating in staff exchanges. The main focus within the network will be to foster cooperation on public transport and energy issues. The chairman of GAPEM, Prof. Kerstens from the Université de Lille, has indicated that he would like to collaborate more closely with IPSE Studies in the future.

NWO accepts ICT standardization research proposal

The Netherlands Organisation for Scientific Research Network of Networks Programme has accepted the proposal on Complex interactions between international standardisation and national innovation projects submitted by the University of Maastricht (Anique Hommels; Wiebe Bijker) and TU Delft (Tineke Egyedi, research group Information and Communication Technology). Tineke Egyedi was senior researcher on the proposal. The research project examines the manner in which national governments address the requirement for international standardised ICT networks (in this case, the European Tetra standards) and the need to adapt these to the specific national situation (in this case, the C2000 project).

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Traffic and transport: forging ahead into the future

to integrate all those different disciplines. And that is precisely where TPM creates added value: we consider technical solutions in a broad social context."

He continues: "Take the construction of a new road, or projects such as the Betuwe Route, the North-South line and the introduction of the chip card for public transport. Projects like that are always very fraught. There is constant friction between those who will benefit from the project and those who are disadvantaged by it. That is typical of the situations we study at TPM. We like to take on complex issues involving different interests. In the future too, almost every transport dossier will touch on what we do at TPM, so it is very logical that TPM has designated traffic and transport as one of its disciplines."

Scientific conscience

The type of knowledge in which TLO specialises is in great demand externally. "Our graduates find work easily and we are often consulted by parties in the transport sector. The media often approach us, as do researchers from other faculties and universities who value our input in their multidisciplinary research. We provide an overall perspective, which is why, for example, the director of Dutch Railways comes to TPM for advice. I have been invited to take part in discussions on major infrastructure projects such as the Zuiderzee Line, the Schiphol-Almere road and the A4. I am consulted as a sort of scientific conscience. People come to us for an impartial, independent contribution."

The key question is how to put together all the building blocks provided by the various experts. Take the day after Easter last

March, for example, when snow caused a record number of traffic tailbacks. "The NOS wanted to be able to explain the social cost and discuss questions such as technologies that can be used to ease traffic congestion in the future, and whether more roads should be built for such situations. You can find experts on each of those subjects, but when it's a question of presenting all the facts in a coherent way, then people come to us. That is what characterises the work of TPM."

There is no shortage of ideas about how things will develop in the future - and no shortage of programmes and articles discussing them. One example is the recent KRO television programme *De Toekomst is Nu* (The Future is Now). The programme showed how, in 50 years' time, we will simply be able to fly over traffic jams. Everyone will be able to use an air taxi - or they may even have their own flying machine. According to the programme, it is highly probable that cars will be able to steer themselves while we sit in the back working or reading the paper.

"I like the fact that these discussions in the media about the future in general, and of traffic and transport in particular, are positive rather than negative. But it's an illusion to think that, in 50 years' time, our transport system will be completely different to the system we have today. Technology has its limitations. I simply don't believe that by 2040 we will all have taken to the skies in personal flying machines. There are too many obstacles. Energy and CO₂ emissions and noise would be a major problem, which means that public acceptance would be too. There are also legal and institutional aspects to consider: do we know how to regulate them? And what about parking problems? We're short of

space already, so just think what would happen if we all had a car and a personal flying machine."

Furthermore, it is a major problem to introduce new types of infrastructure in a crowded country. "You can't simply dispense with the current infrastructure; the only feasible option is gradual integration. Moreover, there are psychological barriers. Driving involves people's emotions. Anything that affects people's emotions relating to cars will meet with resistance. It is already proving difficult to introduce speed adaptation systems, for example. Male drivers feel 'castrated' if their car determines how they drive, so imagine the impact if we were to introduce fundamentally different systems!"

The message is actually that, from a technical point of view, almost anything is possible, but there are many ifs and buts. "I believe more in scenarios in which the distance between cars on the road is reduced, so that road capacity is improved. Advanced payment systems also have a great deal of potential. In any case I expect IT to play a much greater role in the transport system. In short, there are plenty of interesting challenges, and it is good that TPM is studying them. In 50 years' time the world will look very different. The question is, how will it look? And how will we organise it? Who will have an influential role? It isn't just technology that will determine the path to the future, but all manner of other factors too. Fortunately, TLO is multidisciplinary. We have specialists in disciplines including geography, psychology, civil engineering, mathematics, architecture and econometrics/economics. At TLO, we can put together all the pieces of the puzzle."

Multimodal or free-range?

Sometimes I don't know whether I'm pronouncing the word correctly. At first it reminded me of the Dutch word modaal (modal), and I've confused the two ever since. Multimodality. Nice word. Feels comfortable. Just learned it in my new, technical environment. In the field of transport it means something like: ensuring smooth and efficient transport connections for people and freight by car, train, tram, bus, taxi and boat. By linking together the different transport modalities. Last week I was reminded of this when my wife had to take the NS train to The Hague Central Station and discovered that she needed a separate ticket to change to a RandstadRail line. That is a typical example of un-multimodal thinking (not by my wife, but by the transport providers). An un-multimodal approach - a unimodal approach, in fact. It will bring everything to a standstill, especially in the Randstad conurbation - and not only in terms of accessibility and mobility.

I relish the newly learned term. It fits in well with my new work environment. Multimodality comes from the transport sector, but it can be applied in many other contexts. It expresses TPM's principles well. If we link the components - or, if you like, the modules - of a social problem, we can find an appropriate solution. Making connections, and coordinating, organising and restructuring the matter in line with an overall vision. There is a future in this, especially if we consider the problem from the point of view of the person around which the matter revolves: the passenger, the user, the consumer, the patient, the client, the teacher, the pupil, the student, the father, the mother, the babysitter - in short, from the perspective of the individual in all his different roles - or modalities.

Multimodality appeals to me more than another term that I have often heard recently: 'chain'. Technologists like to place related activities in a wider context. A care chain, a security chain, a welfare chain, a transport chain. They all have strong and weak links. A chain keeps things well-organised.

In a hospital, for example, patients progress through a chain that we call medical care. Different modalities are divided up, technically optimised and placed in sequences that are functionally logical - as if on an assembly line. Little attention is paid to the whole. There is no-one to oversee things, such as a foreman on a building site or a head nurse in an operating theatre. The person is no longer visible in the chain. Recently, listening to the radio while waiting in a traffic jam, I heard someone say that providers in the care chain should have more 'freedom of movement' when it comes to giving attention to individuals. It's a well-meaning argument, but a case of curing the symptoms rather than the cause, it seems to me.

At TPM we like to expose the consequences of failing to see the whole picture; of the lack of supervision. We think in terms of systems. So that the unknown black areas between the links remain visible too. So that the person concerned is not reduced to a series of modalities. Because thinking in terms of chains is, in fact, a new form of segregation. Linking components together in a chain can lead to the ordering of specialisms that bear little relation to each other. 'If it ain't broke, don't fix it', as the saying goes.

Thinking in terms of multimodality is more constructive. It is another way of interacting with each other. In multi-actor systems, the players invest in each other in order to tackle a problem in its entirety, with the person at

the centre. New opportunities are created for an intelligent and creative approach. This leads to innovative insights and solutions. For organic systems, we can say: 'if it's broken, you can't fix it'. Linking modalities, ensuring coherence and management according to the bigger picture: that is how we keep healthcare standards high and the Randstad conurbation accessible. It is also the way in which I approach my responsibilities as Dean: multimodally - or is it multimodally? Thanks to the chain approach, I have plenty of time to think about that when I'm held up in a traffic jam.

Prof. Theo Toonen Dean TPM



A green light for intelligent speed regulators?



If motorists could never break the speed limit, our roads would be much safer. A Utopian idea? Not if Dr Vincent Marchau and Sven Vlassenroot have anything to do with it. They are looking for ways to improve road safety and accessibility with methods such as Intelligent Speed Adaptation (ISA).

"A great deal can be done to improve road safety in the Netherlands and Europe", according to Marchau, who is associate professor at TPM. His work currently focuses on the development of implementation strategies for Intelligent Transport Systems (ITS). "Speed plays a crucial role in traffic safety: driving too fast increases the risk of accidents and the seriousness of injuries. Traditional solutions such as speed cameras and automatic speed checks help to a certain extent, but they're not efficient. That is why we are conducting research on a large scale to find smarter methods, such as intelligent speed-adaptation systems." ISA is a collective name for in-car systems that continuously compare the speed of the vehicle with the maximum permitted speed. The system alerts the driver when he/she exceeds the speed limit. In a variant of this, the accelerator pedal exerts a counterforce so that the driver cannot press it down fully, or cannot press it down at all. This is known as the 'active accelerator pedal' system. With ISA technology, it is not the driver who programmes the maximum speed; it is monitored automatically.

Acceptance uncertain

The introduction of ISA is not just a question of technology, however. All manner of aspects are involved, including market demand and acceptance, legal aspects and cost effectiveness. Vlassenroot is a researcher at the University of Ghent and is also working on his PhD at TU Delft. His research focuses on what users think of ISA. "It is still very uncertain to what extent the public will accept ISA. Will people be prepared to buy it? And if so, will they want to use it?"

Studies show that people accept the use of ISA on roads with a low speed limit, such as residential areas. On motorways, however, ISA is only considered desirable in certain conditions such as snow, ice and fog. "A possible explanation is that motorists have to surrender some of their personal freedom. There is another interesting aspect: many people find speeding a problem, but never admit that they are guilty of it themselves. It's always other people who drive too fast. ISA is also seen as a sort of Big Brother, which creates a lot of opposition to it."

The motor industry isn't welcoming ISA with open arms either. "Speed is an important selling point in the motor industry. An ISA system that provides information on speed is fine, but not one that regulates speed. In response to this, a phased compulsory introduction of ISA is now being considered for specific target groups such as young drivers, elderly drivers and notorious speed offenders, as well as in high-risk areas such as cities."

ISA has many advantages. The system is much more flexible than the current infrastructural measures, for example. ISA promotes a consistent driving style, which in turn would reduce the number and length of traffic jams. Improved traffic flow, in other words. ISA can also regulate acceleration, which reduces CO₂ emissions and is better for the environment.

From a technical point of view, everything is already possible. But what functionality will the system have? "That question still has to be answered. Will it be a system that simply warns people, or one that intervenes?" The question is also whether ISA should be made compulsory. "There are certainly ways to do that. Insurers could give premium discounts for motorists who use ISA. However, insurers are not usually prepared to make changes they have not yet been proven effective in practice. Obviously, another option is for the government to enforce ISA. But does the law allow for that? Apart from that, it is definitely not a vote-winner for politicians."

Positive pilots

Scandinavia is making the most progress with ISA. Sweden, for example, wants to reduce traffic fatalities to zero. It was

Vincent Marchau (left) and Sven Vlassenroot

the first country to carry out a large-scale ISA trial, with more than 3,000 vehicles and various ISA variants, in order to study the effect on driving style and traffic behaviour. The Netherlands also launched a trial in 2000, with twenty cars and a bus. This involved an ISA system with an active accelerator pedal. The results were positive. Since then, trials have been held in Spain, England, France, Hungary, Australia and Belgium.

In an initiative by the University of Ghent, regular demonstrations with an ISA car are given, most recently in the centre of *Rotterdam*. "People can experience what it is like to feel resistance from the accelerator pedal when they drive too fast. This is how we try to explain what ISA is and what it does." There are other initiatives too: "In May we launched the European FP7 project SHLOW (SHow me how sLOW). That involves going to universities all over Europe to teach road safety, and explain the role of speed and what can be done with ISA."

ISA is gradually gaining ground. Speed information is already provided via the TomTom, and ISA information in school environments is making headway. A great deal depends on the creation and updating of digital maps that show all the speed limits in an area. Another important step will be the completion of Galileo, a satellite GPS system that is intended to provide more precise measurements than the current GPS. ISA is not expected to be in general use before 2015.

Award for TPM students

Hanane Ouna: the best ethnic-minority student in 2008

She is the best ethnic-minority student in academic education: Hanane Ouna, a fifth-year student of Systems Engineering at TPM. On 2 April this year, Ronald Plasterk, the Minister for Education, Culture and Science, presented Hanane with the 2008 ECHO Award. "I want to show how many talented people there are in the Netherlands."

This is the eighth time that the ECHO Award has been presented. The aim of the award is to create greater opportunities for talented non-western students, who excel in terms of outstanding study results, their ability to break new ground, and their active social involvement. Clearly, these qualities apply to 23-year-old Hanane, who is of Moroccan origin but was born in Rotterdam. Hanane will shortly be graduating in ICT infrastructures and services. "Recently I have concentrated on new technological developments in healthcare. I have analysed the security of the Electronic Medical Record and the Electronic Patient Record. I have also studied the processes relating to the Electronic Child Record", explains Hanane. She has carried out research into why such large-scale projects often go wrong and what the consequences are - in this case, for patients.

Lecturers on Hanane's course asked her at the beginning of this year whether she would be interested in taking part in the ECHO Award. She sent in her list of marks and an accompanying letter, and one of the lecturers sent in a letter explaining why Hanane should be considered for the award. Having made it through the initial selection, Hanane and seventeen other candidates were invited on a Saturday to give a presentation. "We were given exactly five minutes. I had to introduce myself, tell them what I am studying and explain what the award would mean to me personally and why I would like to win the prize, a summer course at the University of California."

"A network of this kind sends out a positive message to Dutch society and shows how much talent there is in the Netherlands."

Eventually the nominations were announced and on 2 April this year, after a nail-biting wait of several hours, the award was presented at the Tropenmuseum in Amsterdam. "I want to feel and experience the excitement of the new movement for change that is emerging in the United States. By the beginning of next year, the United States could have a woman or an Afro-American as its president. I want to experience that historical event", explains Hanane, who would like to pursue a career in consultancy when she graduates. Talking about the importance of the ECHO Award, she says: "The winners will become members of the ECHO Ambassador Network, a network of 250 students who are committed to giving something back to society. A network of this kind sends out a positive message to Dutch society and shows how much talent there is in the Netherlands. I aspire to play an active role in the network. I want to inspire and motivate young western and non-western students."

Hanane is also active internationally as a member of the UN International Communication Union (ITU) Youth Forum Alumni network, an IT network of young people whose aim is to provide access to IT for people in developing countries.

ECHO, Center for Diversity Policy, is a platform for highly talented students. It is designed to give an extra stimulus to their personal development and social involvement, and to encourage them to put their talents to good use for the knowledge economy and in education, the labour market and multicultural society in the Netherlands. The ECHO partners are ING, Shell Nederland, KPMG, TNT, Randstad Nederland and NautaDutilh. See also: www.echofoundation.nl.

FIRST STUDENT TO COMPLETE
THE SEPAM-IA

Information Architecture linked to the corporate vision

Tim Wollersheim looks back on his virtual Master's programme SEPAM-IA at TPM with fond memories. "I learnt the ins and outs of how to combine operational information with ICT", says Wollersheim, who recently became the first TPM student to complete the SEPAM-IA programme. A day after graduating, Wollersheim was already applying his acquired knowledge as a business analyst for ICT provider Capgemini.

SEPAM-IA stands for Systems Engineering Policy Analysis and Management - Information Architecture. What do you want to achieve with a company and how do you combine the organisation-related and ICT-related fields? This, in a nutshell, is what the programme is all about. SEPAM-IA is a combination of Policy Analysis, Management and Communication Technology. Students learn what a corporate vision is and how to incorporate this to good effect in the information architecture of the organisation.

Practical programme

Tim Wollersheim chose this Master's because he was primarily interested in the professional aspect of his TPM programme. This aspect features prominently in the SEPAM-IA component as students learn how to establish the structure of an organisation. In summarising the course, Wollersheim says: "the study components cover a wide range of skills from business analysis to technical implementation and everything in between."

Tim Wollersheim was the first TPM student to embark on the SEPAM-IA three-year programme. "At the TPM faculty you learn everything there is to know about the traditional side of Information Architecture. Meanwhile, at the faculty of Computer Science, you are taught the DEMO approach through a number

of compulsory subjects. DEMO is a methodology for designing, setting up and linking organisations. An important aspect of this is communication. Enterprise Architecture is approached from a completely different angle in this faculty, which I found really interesting."

Information

One of the programme's weak points, according to Wollersheim, is the course information. "Lots of Policy Analysis and Management students think that SEPAM-IA is all about programming. But the programme goes far beyond that. It covers Business Architecture, Organisation Architecture and Application Architecture. What do you want to achieve with your organisation and how do you deploy your ICT infrastructure to meet these objectives? The information material needs to emphasise the multi-faceted aspects of the programme more. I would also like to see a subject introduced that covers the full spectrum of architecture. The course deals only with small-scale assignments and complex examples that are too broad to provide any clear information."

One of the major plus points of the programme for Tim Wollersheim is being able to collaborate with Computer Science students. "This is an ideal way to identify each other's weak points and learn from each other's expertise."

"Lots of Policy Management students think that SEPAM-IA is all about programming. But the programme goes far beyond that."

Tim Wollersheim's life has since entered a new phase: that of the working man. The alarm now goes off at 6 am and gone are the long lie-ins of his former student days. "High demands are placed on your knowledge skills and your interpersonal skills also have to fit within the organisation. Not everyone is cut out for this. Only a very few of those applying to work for Capgemini make it through the selection process. But once you've got past that stage, a world of opportunities awaits."

Levee Patroller takes the Netherlands, Land of Water, by storm

River dikes in the Netherlands are designed with a probability of flooding of once per 1,250 years. For sea dikes, the norm is even once per 10,000 years. The likelihood that dike inspectors - or anyone else in the Netherlands - will experience a dike breach during their lifetime is very small. But... in theory, it could happen when the rivers next reach maximum flood level! So who's keeping an eye on things?

The hundreds of dike inspectors in the Netherlands play a key role in monitoring the dikes. Most of the inspectors are employed

by the water boards. In practice, there are few opportunities for training. Under normal circumstances, river levels are low and cracks, wet areas and other signs of damage are not apparent. Since October 2006, the dike inspectors have been able to make use of Levee Patroller, a simulator for dike inspections developed by TU Delft and the knowledge institute Deltares (formerly GeoDelft). TPM provided the conceptual input. Bachelor students and a final-year EEMCS student were involved in the implementation. A number of water boards were also involved in the project. In the simulator, the dike inspectors have to 'walk' along a few kilometres of simulated dike, set in a realistic Dutch landscape. The weather can be adjusted so that the dike inspectors can practise for extreme conditions.

“Even experts at Deltares sometimes look differently at failure mechanisms in dikes once they have experienced Levee Patroller.”

Raising awareness

TPM researcher Casper Harteveld has been involved in the development of this serious game from the outset.

Levee Patroller has generated a great deal of interest on many fronts. A simplified version of the game has been installed at the NEMO science centre in Amsterdam in order to raise awareness of the fact that a large part of the Netherlands is below sea level. In October 2007, Casper Harteveld was awarded the Bakkenist Young Talent Prize in Information Systems for his thesis entitled *Balancing Reality, Pedagogy and Game: The story behind the design of a serious game called Levee Patroller* (see box).

“Having studied the development of the game, my PhD research now focuses on the impact of Levee Patroller on the organisations that use it”, explains Casper Harteveld. “Even experts at Deltares sometimes look differently at failure mechanisms in dikes once they have experienced Levee Patroller. So you can imagine what sort of impact it will have for dike inspectors. Most of them are from a generation that wasn't brought up with computers and they are very practically minded. But they're very enthusiastic and they think the game is really interesting. It's realistic and useful to work with, and they learn a lot from it. And because it's a game, they laugh a lot too. Those are the most important criteria for any serious game.”

Jury praises accessibility and wide applicability

The jury of the Bakkenist Young Talent Prize in Information Systems commented that the thesis is highly accessible because it explains how the Levee Patroller simulation was developed. At the same time, it addresses theoretical concepts and new insights – an important point for an interdisciplinary study with many potential readers who are not experts in the field. The jury considers the results of the study to be highly applicable in other contexts, particularly now that the younger generations are growing up with games and simulations.

Prestigious Cuperus Prize for Master's thesis on the Superbus

At the beginning of April, TPM/TLO PhD student Chantal Cantarelli unexpectedly found herself in the spotlight. During the Inter-traffic trade fair at the Amsterdam RAI conference and exhibition centre, she was presented with the 2007 Cuperus Prize for her Master's thesis entitled *Superbus, an innovative and dynamic concept? Investigating the feasibility of the Superbus*. The prestigious transport prize is awarded once every two years by the Traffic and Transport Engineering division of KIVI NIRIA (Royal Institution of Engineers in the Netherlands).

Chantal Cantarelli graduated in 2006 under the supervision of Professor Bert van Wee and Hans van Ham. The subject of her graduation project was the Superbus, an innovative high-speed vehicle that makes as few stops as possible. Van Wee nominated her for the Cuperus Prize. “I had to hand in six copies of my thesis because Bert needed them for my nomination. After that I didn't really think much more about it until they telephoned me to say I had won. I was surprised. I'd heard of the Cuperus Prize, but at the time I couldn't recall the exact details”, says Cantarelli modestly.

Door-to-door comfort

The Superbus is the idea of former astronaut Wubbo Ockels. The bus, which will travel in its own lane at speeds of up to 250 km per hour, will provide an intercity link. The concept was conceived as an alternative to the Zuiderzeelijn (ZZLink), a rail link between the north of the Netherlands and the Randstad conurbation in the west. The basic theory is that the buses can offer comfortable door-to-door transport, in competition with the car and the train. The number of stops is kept to a minimum by using a demand-responsive logistics concept: Fast Transport on Request.

In order to create a door-to-door transport system, systems have been developed that allow users to order a journey via the Internet. These systems were developed by, among others, Emeritus

“I didn't know what people outside TU Delft thought of my work. It's good to see that what we learn here is actually used in practice later.”



Professor Joop Evers, also of the TLO section. The system must be able to combine journeys to the same destination, so that there are no (or very few) stops en route.

“In my thesis I wanted to look at the cost-benefit side of the system”, explains Cantarelli. She examined a number of technical and non-technical aspects of the Superbus to determine the best commercial structure.

This included the technical systems (the configuration of the Superbus) and the long-term returns on investment.

Improved configuration

Cantarelli's study sets out possibilities for improving the configuration of the Superbus in terms of speed, price and capacity, among other things. This will improve the economic viability of the Superbus, as well as its utilisation and social feasibility, because the wishes of stakeholders will be taken into account.

The Superbus is an idea for the future and will be developed step-by-step, along with the related infrastructure. Chantal Cantarelli's study is a contribution to the commercial side of this process. “Until the Cuperus Prize, I did my work in the seclusion of the university. I didn't know what people outside TU Delft thought of my work. It's good to see that what we learn here is actually used in practice later.”

The other TPM student apart from Chantal Cantarelli to be nominated for the Cuperus Prize was Maarten Kroesen, who wrote a thesis on the role of non-acoustical factors in noise pollution from aircraft in the area around Schiphol. Both Kroesen and Cantarelli were finalists. Chantal won. She received a cheque for EUR 2,500 and a year's membership of KIVI NIRIA. She is currently carrying out PhD research at TPM/TLO into budget over-runs on major infrastructure projects.

MARINA VAN GEENHUIZEN

Stepping into the breach for the urban economy

In the weekly publication Elsevier, TPM's newly appointed Professor of Innovation and Innovation Policy in the Urban Economy is described as a go-getter. The description is an accurate one.

An impressive CV has taken Professor Marina van Geenhuizen (56) from the universities of Utrecht, Rotterdam and London to Delft, where she was appointed Associate Professor, an appointment which is the crowning moment in her career to date. "But there's still a lot of work to be done", says Van Geenhuizen.

Within the European Union, the Dutch knowledge economy rates from 'mediocre' to 'weak'. Further research is therefore required, especially into what this means for cities. This was the message in the inaugural lecture of Professor Marina van Geenhuizen, recently appointed to the chair of Innovation and Innovation Policy in the Urban Economy. The lecture took place on 9 May this year in the Aula at TU Delft. "Our country is lagging behind in several innovation indicators. The Randstad conurbation is also performing less well than other European cities according to certain key indicators."

More nerve required

According to Van Geenhuizen, the Dutch knowledge economy could perform much better. "Our country has enough talent and new knowledge, but we don't have the nerve to make long-term capital investments or make the choices that will enable us to

compete successfully on an international level. But we're moving in the right direction, partly thanks to the decentralised approach of the Ministry of Economic Affairs policy document 'Peaks in the Delta'."

The field in which Van Geenhuizen works - innovation and innovation policy in the urban economy - combines applied spatial economics and policy studies/analysis. The aim of the discipline is to stimulate innovation in local/regional economies. Students at the Faculty of Technology, Policy and Management will receive lectures on innovation in companies, the spatial-economic requirements for that innovation, and its significance for the city/region (competitive position) and related policy. This still needs to be structured as a degree profile for 'Land Use and Development'. In addition to this, Van Geenhuizen, who graduated in 1979 in Social and Economic Geography, is continuing her interfaculty teaching in Spatial Economics.

Dynamic

Van Geenhuizen sees her appointment as an opportunity to continue and extend her recently published research on urban knowledge networks of innovative companies. "I want to identify the most valuable knowledge networks for growth and innovation. I will be looking at the local/regional versus the global perspective, fast versus slow valorisation, and the merits of having networks (or not) with the SME sector. The origins of the networks and their steerability need to be analysed. We have to identify the dynamics of the networks," says the Professor. That involves looking at aspects such as the accessibility of new companies' locations, telecommunications, work flexibilisation, and a less central role for the business location.

However, the chair is not a tonic for sluggish economies, Van Geenhuizen warns: "Cities and the problems they encounter are too diverse for that. But cities can learn from each other's differences and use that knowledge to come up with new solutions." Van Geenhuizen warns entrepreneurs against the risk of tunnel vision in their network relations. "If local/regional networks predominate, they risk becoming too closed, which limits the influx of new knowledge. Entrepreneurs themselves should evaluate their networks according to that criterion from time to time. In some companies, this is already a standard part of network management."

Pinnacle

The new professor is currently limiting her consultancy work to a single client: the municipality of Delft. Depending on the results of problem analyses, Professor Van Geenhuizen will advise the municipality on aspects relating to the knowledge economy such as how companies should cooperate, additional training, or the facilitating of new spin-offs from educational institutions.

In a sense, Marina van Geenhuizen sees the chair as the pinnacle of her work. "But", she says, "there's still a great deal to do." She is referring to the social networks of spin-offs from TU Delft and other universities, and in particular how they contribute to growth and evolve over time. She will be extending her research into the growth of life-science companies and the influence of the national innovation system and policy. Finally: "My ambition is to lead a small or medium-sized research group in which I can inspire people and stimulate their interest in the subject. Successful funding applications would certainly be helpful in that respect."

DIANA VONK NOORDEGRAAF HAS RESEARCHED

The impact of kilometre pricing on road freight transport



The Dutch cabinet has taken the decision to introduce kilometre pricing. Diana Vonk Noordegraaf chose this subject for her final-year project 'Prijsbeleid en Goederenwegvervoer'. ('Pricing Policy and Road Freight Transport). She looked

at how individual companies will respond to the measure. Diana has now graduated with distinction and is continuing her research at TPM and TNO.

In the future, roads users will no longer pay for owning a vehicle, but for using it. Fixed taxes such as road tax (MRB) and vehicle purchase tax (BPM) will be phased out. Instead, road users will have to pay a kilometre charge based on time, location and the environmental characteristics of their vehicle. The measure will be introduced for freight transport in 2011 and for passenger transport in 2012. The intention is that the system will be fully operational by 2016.

"Existing research focuses on passenger transport, which is logical because kilometre pricing is about different ways of paying for

mobility, and motorists are the largest group of road users to whom the new system will apply. The assumption is also that motorists can change their behaviour, which is much less likely for freight traffic. Apart from cost-benefit analyses, little is known about the impact of kilometre pricing on road freight transport. I was interested in how individual companies will respond to kilometre pricing."

Together with PhD student Anjali Mahendra of the Massachusetts Institute of Technology, Diana visited 21 hauliers and shippers of varying sizes, from a wide range of sectors and different stages in the supply chain. "Most of them weren't very well informed and were concentrating on day-to-day business. When we had explained the situation to them, the responses were, for the most part, that a scenario in which congestion is reduced by 30% is a Utopian idea. Above all, the companies expected costs to increase."

Complexity

The key question is: who will foot the bill? "This led to an interesting discussion. Hauliers provide transport services to shippers and therefore think that they can pass on the levy to the customer. The shippers, on the other hand, assume that kilometre pricing will generate time savings for the hauliers, and they therefore expect a better service or a lower price. Other options are to employ a different logistics strategy and improve efficiency, but in many cases there is no further scope for doing that. That is precisely why this research project is so important; you become aware of how complex the problems are, and realise that in fact there is not a universal solution."

Since May 2007, Diana has worked at the Transport Policy and Logistics Organisation section at TPM. She is affiliated to the Transumo project 'Rush-Hour Avoidance', in which the public sector, private sector and universities are working together to establish how motorists can be persuaded to avoid travelling at peak times. In 2006, a first trial was carried out with 340 participants who regularly drive on the Zoetermeer-The Hague route in the morning rush hour. They were awarded up to 7 euros each time they avoided travelling in the rush hour. The result: participants made 50% fewer peak journeys. "At TPM we are researching what the policy actors think of this instrument. Scepticism has already made way for enthusiasm. It is possible that Rush-Hour Avoidance will be used during roadworks, or that pricing policy will be based on a bonus-malus system. A follow-up trial is planned between Gouda and The Hague in 2008."

In January this year, Diana began her PhD research. "I am continuing my work on policy from the perspective of systems engineering, policy analysis and management. I also spend three days a week doing consultancy work at the Mobility and Logistics business unit at TNO. One of the things I am working on is the Transumo A15 project. We are researching how to keep the port of Rotterdam accessible after 2020 while fulfilling the sustainability requirements. We have worked with all the parties involved to develop measures. TNO has calculated these, and this year an implementation roadmap will be developed. Charging and pricing are aspects of this project too. My role is to look at how pricing policy for the Mainport should be structured - another interesting challenge."



LIGHT-RAIL NETWORK TURNED INTO A HEAVY TASK

'Complexity gradually crept into the process'

On the evening of Wednesday 29 November 2006, two RandstadRail trams derailed shortly after each other at the Ternoot and Forepark stops in The Hague. Seventeen passengers were injured in the Forepark derailment. The Haaglanden local authority launched an investigation into the RandstadRail section in The Hague. A team from TPM was awarded the contract in a public tender and set to work under the supervision of Professor Ernst ten Heuvelhof and Associate Professor Joop Koppenjan. A report by Joop Koppenjan and Martijn Leijten, one of the six researchers.

How could an apparently uncomplicated project get so out of hand? "RandstadRail appeared straightforward, even though it was a new form of transport. Existing rolling stock would be used on the existing rails. The operator was experienced and the technology was bought 'off the shelf'. So what could possibly go wrong?" asks Koppenjan. Leijten: "If things had gone just a little differently, everything would have been a success. The points at Forepark would not have been damaged, or the fault would have been discovered in good time. There would have been no incidents. If things had gone just a little differently, it would have been a fantastic project: a good public-transport system, delivered within budget and almost on schedule. Some people say that RandstadRail was dogged by misfortune, and in a sense they are right."

Complex

But... RandstadRail is the first light-rail project in the Netherlands and no-one realized how complex it would be. No-one realized how complicated it would be to implement innovations in existing technical systems, or that existing systems could not simply be linked together without a problem. Or that politicians would put pressure on the engineers to keep to schedule. Added to that, there was not actually a legal framework in place for light rail. Koppenjan: "The Ministry of Transport, Public Works and Water

Management developed the framework more or less in tandem with the project. All in all, the parties involved underestimated the complexity of the project. The most misleading aspect was that they thought they had all the necessary expertise. They didn't know what they didn't know."

Koppenjan and Leijten argue that complexity gradually crept into the project. "Complexity is managed by 'cutting up' both the project organisation and the process into 'fragments' that are straightforward and easy to manage. But at some stage the fragments have to be 'joined together' again. And that is what went wrong with RandstadRail." The TPM researchers found that many of the mistakes were made in the modification period. The 'OTP period' (modification, testing and trial run) took three months. Leijten: "A crucial factor was that, in the end, the trial run lasted only three days. It consisted of a rush-hour service without passengers. Amazingly, it went quite well, despite the fact that there were a lot of disruptions in the period before and after. But there wasn't any more time available for testing and a trial run. The commissioning party wanted to keep to the schedule and stay within budget. After all the problems with tram tunnel in The Hague, the Haaglanden local authority didn't want to things to go wrong again."

Conclusion

Koppenjan: "In our study we conclude that the programme of requirements was a general one, which meant that a lot of changes had to be made as the project progressed. Because the budget and deadlines were tight, the planning was not flexible enough to allow for changes to be implemented properly. We've seen other situations in which officials have problems managing large-scale projects because it's so difficult to assess how complex they are. They are often afraid that they'll be taken for a ride if they let go of the reins, and that the project will spiral out of control. Officials are usually held to account for that."

Furthermore, relations between officials and managers were strained at RandstadRail. Koppenjan: "Managers indicated that something could not be done, but at the same time they wanted to cooperate with the officials. That put them in a difficult position. The official says: 'I have to make the decision; I'm under pressure. Can it be done or not?' But the technical reality is often much more complicated than the administrative reality, in which politicians just want to hear 'yes' or 'no.'"

The fact that officials have problems steering complex projects was also evident in projects such as the High-Speed Line South, the refurbishment of the Rijksmuseum, the construction of the Amsterdam North/South line, and from the problems with the tunnels in the A73. But lessons have been learned from the RandstadRail project, according to the TPM researchers. "In the Hoekse Lijn project it was decided to take the line out of service for an extended period during the upgrade to light rail. That is precisely what the officials had tried to avoid with RandstadRail."

Recommendation

"Complex projects can't be mapped out step-by-step in advance", admit Koppenjan and Leijten. "But you can set out conditions for good adaptive management in advance. The basic message in our recommendation is: consider how, without suddenly letting go of the reins, you can create a framework that allows greater flexibility for responding to uncertainties and changes. Our solution is to create checks and balances in the management process. In addition to a councillor who is responsible for

finance and progress, there should be another official - independent of the first - to monitor quality aspects. At the same time, parties must agree in advance on ground rules for dealing with any conflicts that arise - you don't want the project to stagnate because of conflicts."

The summary of the study on the RandstadRail section in The Hague can be found at www.haaglanden.nl.

Flexibility is the key to airport strategic planning

What should the airport of the future look like?

It is no longer enough simply to base long-range plans on demand forecasts. Other factors are increasingly playing a crucial role. "You have to be prepared for anything", say Prof. Warren Walker and Dr Vincent Marchau, who are researching ways to improve airport strategic planning.

The civil aviation sector is one of the most dynamic in the global economy. This also makes it one of the least predictable sectors. Changes happen on a daily basis: Airlines form new alliances, airports change ownership and aviation technology is continually developing. "Globalisation and the dynamic nature of aviation make long-term planning difficult. But it is vital to start thinking now about what may prove necessary in the near future. Infrastructure changes can take as long as 20 to 30 years from plans to implementation."

The aviation sector also influences the lives of many people in many ways - economically, environmentally, and socially. Today, an airport's development and planning requires much broader analysis than in the past. While the focus in airport planning has always been on providing sufficient capacity with respect to future traffic demand, nowadays additional aspects, such as environmental issues and financial performance, need to be addressed. The challenge is not only a matter of new technology and smart spatial planning, it is also a matter of creative cooperation and regulation on different institutional levels and with a variety of stakeholders. If the needs of the various stakeholders are not taken into account, the policies that result from the analysis will run the risk of getting delayed, changed, or even never implemented, due to lack of stakeholder support.

So, what is needed is an approach to long-term strategic planning that takes into account the deep uncertainties about future relevant developments (e.g. oil-prices, changes in aircraft, mergers between airlines, demand for air transport) and the goals and objectives of the multiple actors involved. The one thing that is certain is that a static solution based on a single long-term forecast and the objectives of the airport alone is unlikely to be the best way to proceed. Using this approach, which is the traditional approach, the likelihood of making a wrong decision is high. "Take the example of Mirabel Airport in Canada, plans for which began some 20 years ago. The idea was that it would become Montréal's main passenger airport, but the project turned into a fiasco. It is now used primarily for goods traffic. As for Schiphol, forecasts in 1990 suggested that it would not reach the level of 40 million passengers until 2015, but we have already exceeded that figure."

Policymaking would not be so hard if there were no unpredictable external factors. "You always know that something is going to happen but you never know for certain what it will be nor when it will take place." For example, it remains unclear what an airline like Alitalia will do, now that Berlusconi has been re-elected. Or looking back, no one could have predicted the Air France Concorde accident near Paris in July 2000. But it did signal the end for the supersonic passenger aircraft. And as a result of that, the need for the long landing runways simply disappeared. "So you never really know what factors need to be taken account in devising your strategic vision. The secret is to remain as flexible as possible. Smart thinking and flexibility are the keys to success."

The message that Walker and Marchau are eager to convey with regard to airport strategic planning is closely linked to this:

"Smart thinking and flexibility are the keys to success."

"The major events that change the world, like 9/11, are impossible to predict. They are the 'unknown unknowns'. You need to come up with a plan that will work without having to predict the future. Flexible and adjustable strategies enable you to be prepared for anything. This is the message that we try to convey to policy-makers." The work of Walker and Marchau involves developing and testing innovative approaches to handle uncertainties related to airport strategic planning. Examples include dynamic strategic planning and adaptive strategies.

Dynamic strategic planning is an approach for designing a flexible plan that can be adjusted over time to the actual situation and conditions. As such, bad situations can be avoided and opportunities can be seized. The resulting plan enables development over several stages; it commits only to a first stage, and then proposes different developments in the second and subsequent stages.

Adaptive strategies do not attempt to 'see the future', but adapt to changing conditions and include near-term actions, ways to monitor changes in external factors, and actions to take in the future for a range of external developments.

If an adaptive strategy had been implemented as part of the PKB Schiphol in 1995, monitoring would have revealed that the noise limits would be reached sooner than expected. As a response, corrective action could have been taken, preventing the temporary shut down of the airport that occurred in 1999.



'Investigative committees sometimes communicate convenient truths'



SUPPORTING THE PROPOSITION

Prof. J.A. (Hans) de Bruijn

"First of all, let me emphasise that I think investigative committees are very useful. You learn a lot from them and they have an important function in society: when there is a disaster, you have to find out how it happened. Committees therefore help to quell public unease. I am also impressed by the highly detailed reconstruction of facts. But at the same time I wonder: what is the mindset of the committee? When a serious event happens, you reconstruct the complex of facts and you interpret them. It is true that committees sometimes come up with obvious explanations: legislation and regulations were not complied with (the Schiphol fire), public authorities did not work together properly (as in the case of the 'Maasmeisje', murdered girl) and information was not exchanged (as in 9/11).

I would like investigative committees to go a step further and ask 'why?'. Why were legislation and regulations not complied with? Why was there not sufficient cooperation? Why was information not exchanged? When you look into that, very interesting information comes to light. Things are never black and white. If you know the underlying reason, you can form a more detailed picture and discover what happened. The Yom Kippur War is a good example of a situation in which the 'why' question was crucial but not asked. On 6 October 1973, Syria and Egypt suddenly attacked Israel. Despite the clear warning signs - large-scale mobilisation by Syria and Egypt - that an attack was imminent, the intelligence services made reassuring noises. It's easy to blame the intelligence services, but the question is why did they not sound the alarm? The explanation is that the Egyptian army had already been mobilised 19 times. For the umpteenth time, the services had to assess the likelihood of war. It is clear that the intelligence services made a mistake, but knowledge of what went before produces a much less black-and-white picture.

Continued questioning produces a more realistic picture. In itself, the fact that a local authority did not comply fully with the rules when issuing a licence does not tell me much. I want to know why. Disinclination? Ignorance? Strong pressure from the applicant? A balancing of interests that was quite justified at the time? Why do people act in a certain way? This is the question that investigative committees need to address if they are to be more successful. Questioning produces a less clear-cut picture of the reality, and it is often more difficult to communicate than a straightforward picture. So there is a tension between establishing the truth and responsibility to the public.

My second criticism relates to the fact that attention is focused on what went wrong. An action often goes well 999 times and goes wrong only once. Yet we are always searching for improve-

ments. But why? Why shouldn't we accept the one occasion on which things go wrong? There is such a thing as fate or misfortune, after all. The cost of preventing something from happening once can simply be too high. I can illustrate this with an example from the world of law enforcement, where careful distinctions have to be made between the 'good guys' and the 'bad guys'. Strategic considerations have to be continually weighed-up.

The good guys are usually approached in a friendly way - we call it 'soft' enforcement. Sometimes law enforcers turn a blind eye to certain matters in order to foster goodwill and encourage cooperation. A much stronger approach is used towards the bad guys. Rules are enforced, sanctions are applied. Then one of the good guys turns out to be a wolf in sheep's clothing - a bad guy, in other words. Disaster follows, and a committee sets to work. An investigative committee concludes that the rules were not properly enforced, despite the fact that the law enforcers should have picked up the warning signs. Recommendation: hard enforcement and full enforcement - in the 999 other cases too. So we have a solution for this one problem, but you have quite a different picture if you apply it to the other 999 cases too. As a result, however, the law enforcer loses the goodwill he has established with the 999 companies that are of good will. No-one will volunteer information any more. The consequences are predictable: hard enforcement does not work, so the old situation is restored and hardly anything changes. Why? Because when the recommendations were formulated, no-one took account of the fact that the strategy that failed on one occasion was successful in 999 other cases."

Prof. J.A. (Hans) de Bruijn is Professor of Public Administration/ Organisation & Management at TPM. He is the author of the essay 'Een gemakkelijke waarheid. Waarom we niet leren van onderzoekscommissies' ('A Convenient Truth. Why we don't learn from investigative committees.') - available from the POLG office (H.Verwest-Sinnema@tudelft.nl) or can be downloaded from www.nsob.nl.



OPPOSING THE PROPOSITION

Prof. F.J.H. (Ferdinand) Mertens

"Investigations are carried out on the assumption that they are useful. After all, we can learn from things that go wrong. Investigations are not about individuals but about organisations, and we don't (yet) know how they learn. Many organisation experts are in favour of failure investigations that ask: how could it have happened? People find it difficult to learn. We know that learning processes

are triggered by distinctive events that create a sense of urgency. When a traumatic experience or other event makes an impression on us, we have to learn. The learning process is a consequence of discontinuity in life. People often make changes in their lives after a divorce or a death.

This knowledge doesn't necessarily apply to organisations because they consist of groups of people. A great deal of research has been done on High Reliability Organisations (HROs), organisations such as nuclear power stations and airlines that perform consistently well and have reliable processes. Reliability is a priority for HROs because errors can have disastrous consequences. The interesting thing is that these organisations continually ask questions when mistakes are made. They have mechanisms in place that encourage people to think about what went wrong. This creates a safety culture that is intended to trigger learning processes. People are not called to account for their mistakes, but are challenged to analyse them.

After a serious incident, you often see that a system organisation is created above the organisation in which the failure occurred. The committee focuses on the incident to examine what is going on at a higher level. You might wonder how useful that is. The result is something like a public penance: someone has to wear the hair shirt. When something affects the public interest, it should be investigated by an independent committee to ensure that the findings are impartial.

If an investigation does not ask the 'why' question, that is regrettable. Fortunately, the question is asked. The investigation into the Schiphol fire was a series of 'why' questions: why did the fire start? Why was no-one saved? Why was the fire brigade unable to find the main entrance? The 'why' questions were asked at every level of the organisation. In my view, one of the strong points of the report was that the investigative committee delved deep into the chain of causality.

In my view, it is important to alert people to the facts, explain things clearly and use the information as input in the public discussion. Reports by investigative committees serve as fuel for discussion. If they do not, then we will not learn from them. Take the Hulshof report on the toxic-waste ship Probo Koala that Hans de Bruijn refers to. People should still be discussing that report because there are a lot of lessons to be learned from it. However, the way in which it was written gives the impression that it is concealing the facts instead of inviting discussion. Rather than feeling encouraged to ask questions, everyone who reads it wonders 'what are they whitewashing this time?'

Opinions always differ as to the precise chain of events. It takes courage to investigate that. It is easier to sweep things under the carpet and leave the problems for what they are. In management science this approach is known as 'shit happens'. Problems are never solved; nothing lasts forever. And there is a constant struggle between priorities. In some cases priority is given to safety, in other cases to cost or the environment. The Dutch Safety Board gives priority to safety - that is its task. We aim to do this 'in all reasonableness', i.e. without neglecting other legitimate considerations.

The methodology of accident investigation will be part of the study programme of the Safety Science Group, focusing on the analysis of previous research, long-term effects and the most effective methods. Incidents such as Probo Koala are typically multidisciplinary and therefore characteristic of TPM subjects, focusing on technology, policy and management. The majority of accidents involve these components. I think many parties in the public domain will be interested in knowledge relating to the field of 'accident investigation', which should also consider the effects of different types of investigation.

Prof. Ferdinand Mertens is part-time Professor of Regulation and Safety at TPM and a member of the Dutch Safety Board.

continuation of page 1

News in brief

Egyedi Vice-Chairperson of ICES

Dr Tineke Egyedi has been appointed as the new vice-chairman of International Cooperation for Education about Standardization (ICES). The decision was made during a meeting organised by the National Institute of Standards and Technology in the United States on 22 February 2008. Last June, Egyedi was elected to her second term as president of the European Academy for Standardization.

Substantial research donation from Saudi Aramco

Professor Guus Berkhout, Professor of Innovation at the Faculty of Technology, Policy and Management is the happy recipient of \$500,000 to support his research. The donation comes from Saudi Aramco, the most influential oil company in the world. Professor Berkhout is free to spend the money as he wishes. He has already earmarked the funds for two key projects: to fund the development of a new geophysical imaging concept and to develop his ideas on exploiting the uncertainties inherent in entrepreneurship.

For Profit and Prosperity

Roads, railway lines and bridges, harbours and cities, irrigation and drinking water supplies: evidence of the presence of Dutch engineers in the former Dutch East Indies can be found everywhere in Indonesia.

The book 'For Profit and Prosperity: The Contribution made by Dutch Engineers to Public Works in Indonesia, 1800-2000', places this legacy from the colonial past in its true perspective. This publication provides a detailed description of some of the most important civil works of the Dutch East Indian era, while also outlining the contribution made by the Netherlands to the restoration, modernisation and development of such works in the Republic of Indonesia. Co-written and co-edited by Wim Ravesteijn (TPM) and Jan Kop.

The road leading to the south coast of Java near Garoet, approximately 1925.



Pierre Koning of IPSE Studies advises parliamentary hearing

On Wednesday 26 March, Pierre Koning of the IPSE Studies took part in a parliamentary advisory hearing on the effectiveness of reintegration. The basis for the hearing was the report Policy Progress Report on Reintegration, published in January 2008, in which the Ministry of Social Affairs and Employment examined the efficiency and effectiveness of procedures relating to unemployment and social security benefits. The report described the government's reintegration policies as having a 'slight positive effect'.

This disappointing conclusion was reason enough for parliament to organise a hearing involving experts from the academic world, from the executive bodies and from special interest groups. In addition to Pierre Koning of IPSE Studies, invitations were extended to Jan van Ours (Tilburg University), Wim Zwinkels (TNO Work and Employment), Ludo Struyven (KU Leuven), and Lucy Kok (SEO Economic Research). The discussion between the experts and the MPs centred not only on possible explanations for the largely disappointing effectiveness but also on possibilities for improvement, such as tailoring procedures to specific groups rather than the population as a whole.

Dissertations



LAURENS ROOK, *Imitation in Creative Task Performance*, Rotterdam, March 2008

Common wisdom has it that 'apes ape' and what 'monkeys see, monkeys do'. Humans beings, though, by far and beyond outperform apes in their capacity for imitation. Copying the behavior of others is such a central capacity in mankind that imitation of the creative products and/or ideas of others also should be an essential ingredient in creative task performance. Much biographical evidence on creative professionals in conjunction with research on imitation in management literature highlights the role of imitation in the creative process. However, previous studies hardly concentrated on behavioral determinants and/or motivational underpinnings of imitation in creative performance settings.

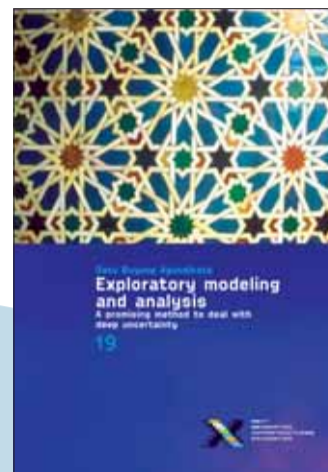
To fill this void, the present dissertation reports a series of four laboratory experiments to show that imitation is a component of creative task performance, which differs from creativity in its reliance upon exemplars of other's creative performance. It was found that imitation is an element of creative task performance, which is sometimes negatively, but other times positively related to creativity.

Moreover, it was shown that contextual factors such as the quality of exemplars of other's performance and presentation of such exemplars in abstract or specific terms play a powerful role in the creative process, while it was acknowledged that one's tendencies to rely upon creative exemplars and one's subsequent imitative or creative actions also depend on one's dispositions to engage in social comparison, and on one's self-regulatory focus. Imitation thus is an important factor in the creative process and worthwhile to further investigate in greater detail.

B. AGUSDINATA, *Exploratory Modeling and Analysis: A Promising Method to Deal with Deep Uncertainty*, Delft, April 2008

Increasingly faced with high stake policy problems, decision-makers cannot afford to ignore uncertainty. Of particular concern are policy problems involving deep uncertainty. The PhD research showcases a promising quantitative and computational method for dealing with deep uncertainty: exploratory modeling and analysis (EMA). EMA explores the performance of alternative policies across multiple hypotheses about the system of interest. The method combines the capability of computers to carry out large numbers of model runs and the capability of humans to recognize patterns that are useful for policy design.

EMA applications include three cases in energy infrastructure investment, transport safety, and CO₂ reduction. Decision-makers, analysts, consultants, researchers, and students can



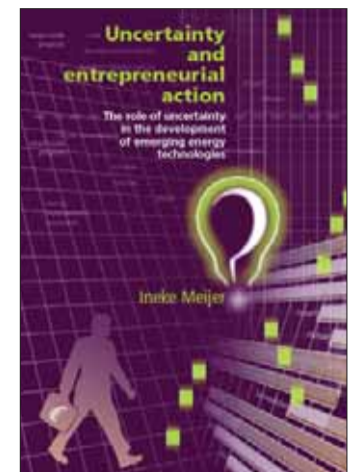
benefit from the original contributions the book provides on the conceptual framework, structured step-wise applications, and innovative analytical support to multi-criteria and multi-actor decision problems.

INEKE MEIJER, *'Uncertainty and entrepreneurial action'*, Delft, June 2008

Innovation decisions inherently involve many uncertainties. This is especially the case for decisions on emerging energy technologies. On the one hand, these uncertainties signify the wide range of opportunities that a new technology has to offer. On the other hand, these uncertainties may pose a threat as they signify a lack of control over the outcomes of innovation activities. This thesis aims at gaining a better understanding of the role of perceived uncertainties in the development and implementation of emerging, more sustainable energy technologies. For these technologies to break through, it is essential that entrepreneurial activities are initiated to help turn the outcomes of R&D activities into commercial technologies that are implemented on a large scale.

In four case studies (micro-CHP, biofuels, biomass gasification and biomass combustion), the author analyzes what types of uncertainties play a dominant role and how these uncertainties influence the decisions and actions of the entrepreneurs involved. Out of the six sources of uncertainty (technological, resource, competitive, supplier, consumer and political uncertainty), political uncertainty proves to be dominant. This uncertainty mainly results from the frequent changes to the energy policy of the Dutch government over the past years. Apart from political uncertainty, many entrepreneurs also perceive great technological uncertainty and uncertainty about the availability of biomass and financial resources.

The results show how perceived uncertainties and negative interactions between different sources of uncertainty and factors in the project environment frequently hinder entrepreneurial action. The thesis provides valuable insights for scientists, policy-makers and entrepreneurs.



Professor Profile

NAME

Margot Weijnen

FUNCTION

Full professor for Proces and Energy Systems Engineering

Career in brief:

"After taking my doctoraal in Chemical Technology and obtaining my PhD from TU Delft, I worked for Shell in Amsterdam, Pernis and The Hague. From 1990 to 1995 I was scientific director of Interduct, the Delft University Clean Technology Institute. In 1995 I was appointed Professor of Process and Energy Systems, and in 2000 I became head of the Technology section (now Infrastructure Systems & Services) at the Faculty of Technology, Policy and Management. In 1998 I was appointed scientific director of the Delft Research Center for the Design and Management of Infrastructures, and I have been director of the Next Generation Infrastructures Foundation since 2003."

The person behind the prof:

"I am married and we don't have children. I have four strokeable cats. The little spare time I have during the week is taken up with playing the piano, and every Saturday my husband and I go horse-riding for an hour or so. We enjoy travelling, and if there's an opportunity to go diving, then we do. We are keen shell collectors, but I'd like to emphasise that we never bring back shells when we go diving. It's our principle never to touch anything when we're underwater. In between all these activities, there's usually a book I'm reading, and my orchid collection requires quite a lot of attention too."

Best quality:

"Other people find me a very driven person, I think. Yes, when I really want something I'm very single-minded about it. For example, after an exploratory phase of interfaculty research in Delft, the programme Next Generation Infrastructures, has really taken off on an international scale. Because I believed in NGInfra and its importance for the development and research profile of the faculty, I was highly motivated to keep going and find the resources that will meet our level of ambition: to create a leading knowledge centre in Europe. I can't let go of my vision, and it motivates me to pull out all the stops. The purely operational side of things is not my strong point. For that I need practical people around me, whom I can trust to implement things. Obviously, my drive also has a down side. I can be quite monomaniacal. On those occasions, the rest of the world ceases to exist for a while and I'm not very sociable at home."

Life motto:

"Don't regret the choices you make. Try to learn from them. Above all, look ahead."

Difficult:

"Making choices. I like to leave as many doors open as possible. At school I found it really difficult to choose my subjects because I enjoyed them all and was actually good at everything."

I remember how difficult it was for me to choose a degree course. In the end I opted for Chemical Technology, but I could just as easily have chosen history and I would have been just as happy with that."

Who or what has most inspired you in your scientific career?

"That's difficult to answer because I've worked in so many knowledge fields. Looking back, I can see that there was a logical progression. My interest in networks in the process industry evolved into an interest in large-scale infrastructure networks, which are the backbone of the economy, and in fact they determine how we live our day-to-day lives. From the field of clean technology I moved into the world of environmental and energy policy, and then into technology and innovation policy. In the context of my external networks, as a member of organisations such as the Dutch Energy Council, the Advisory Council for Science and Technology Policy, and the first Innovation Platform chaired by Balkenende, I have had the privilege of meeting many inspiring people with a wealth of experience. The external contacts I have through my advisory and executive work are hugely enriching for me. I also draw inspiration from other cultures. For me, travel is an inexhaustible source of inspiration."

What sort of teacher are you?

"I'm a real chatterbox. I always have too much to say and I have to be careful that my lectures don't over-run. What strikes me is that the groups of students vary so much from year to year. Each year group has its own character and group dynamic. I always enjoy it if a group takes an active interest, is critical, and asks a lot of questions. Those are the most rewarding lectures."

Telegraaf or Volkskrant?

"The NRC. I always skim through the columns by Frits Abrahams and Gerrit Komrij. And obviously I read Fokke & Sukke. I don't watch much television, and when I do it's usually current-affairs programmes such as Netwerk and Pauw & Witteman. I think Paul de Leeuw is terrible. I really can't stand him."

What are you doing in India?

"A knowledge centre for Science, Technology and Policy has been set up in Bangalore with the support of the Indian government and the private sector. They want to work with us to develop a laboratory for Next Generation Infrastructures. They want to learn from our experiences, and we foresee close cooperation. For us it is an excellent opportunity to test the applicability of NGInfra knowledge in the economic and cultural context of India. Apart from that, there is a wealth of valuable research material available in this country where all those new infrastructures are still being built. India is a remarkable country, with high-calibre engineering courses, a democratic system of government, an independent judiciary and a rapidly growing middle class. But it's also struggling with corruption and a caste system that is still deeply rooted. The casual observer probably sees nothing but chaos and congestion, but Indian companies are really beginning to make their mark in the world, including the Netherlands - take Mittal and Tata. Bangalore is India's showcase for technology and innovation. It's a hive of energy. I always come back feeling really buoyed up and energised."



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Curius



We've almost reached the end of the final quarter, and it's almost time for the members of the Board to get back to their studies.

Fortunately, there have been plenty of activities in the past few weeks to look back on. There were several trips in April, beginning with a week relaxing in Egypt for the Board.

No sooner were we back again than it was time to accompany 40 second and third-years to Milan, where we visited Capgemini. Apart from the career-oriented part of the trip, there was enough time to see the sights of Milan.

The following week, it was time for the International Business Tour. Thirty Master's students spent five days visiting companies in Amsterdam, Dortmund and London. The crossing to England by boat was a success, but even on dry land everyone was still swaying on their feet.

After all this travelling (and, as it turned out, very little sleep), everyone was ready for the May vacation. When that was over, we enthusiastically got down to work and put all our energy into organising enjoyable activities for the last couple of weeks. The Master's Committee were very busy. In just two weeks they managed to organise a trip to Brussels and a Career Event.



Both activities were a great success for many Dutch and international Master's students.

Apart from the serious excursions, this year we took part in the Batavieren Race for the first time. Very sporty of us! Considering this was our debut at the event, we didn't do too badly - we ended 126th out of 330 teams.

Naturally, there was enough time for socialising too, first at the foam party organised at the student society 'de Bolk', which for this particular occasion was transformed into a veritable palace of foam.

And we mustn't forget the TB Café. At the time of writing, the first of four trial runs has just ended. The aim of the TB Café is to show everyone in the faculty how much demand there is for a meeting place at TPM. We hope we've been successful and that there will soon be a 'real' TB Café.



As we mentioned earlier, we've nearly reached the end of our year. Six enthusiastic new people are waiting to take our place.

The 15th Board of SVTB Curius

TPM's educational programmes

- **BSc Systems Engineering, Policy Analysis and Management ('Technische Bestuurskunde', TB)**
- **MSc Systems Engineering, Policy Analysis and Management (SEPAM)**
- **MSc Management of Technology (MoT)**
- **MSc Engineering and Policy Analysis (EPA)**
- **MSc Transport, Infrastructure and Logistics (TIL)**
(in cooperation with the Faculty of Civil Engineering & Geosciences and the Faculty of Mechanical, Maritime and Materials Engineering)
- **MSc Information Architecture (IA)**
(in cooperation with the Faculty of Electrical Engineering, Applied Mathematics and Computer Science)
- **MSc Geomatics**
(in cooperation with the Faculty of Civil Engineering & Geosciences and the Faculty of Aerospace Engineering)

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Did you thoroughly read the available information and are you considering enrollment in a TPM-programme? Are you not sure your educational background is sufficient?

Then please contact one of our study advisors:

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ASK TPM

At the end of last year, the Dutch Minister of Home Affairs, Guusje ter Horst, announced that within two years the bill on national security regions would regulate disaster and crisis management in the Netherlands. Given the complex nature of disasters, the independent parties involved and the diversity in information systems employed, this will be a huge task. Time and time again, emergency response exercises have shown the information exchange between parties to be abysmal. A possible solution to the problem would be to ensure that the emergency services exchange all available information. This, however, would result in a huge overload of information and emergency response teams would not be able to see the wood for the trees. So, what's the solution?

Nitesh Bharosa, from the section Information and Communication Technology, is the best person to answer this question.

His doctoral research examines the roots of the problem and sees the poor quality of information (for example, inaccurate, outdated or inconsistent information) as symptomatic of a larger problem: that the information systems used on a daily basis are not adaptable enough to be able to provide relief workers with high quality up-to-date information during a disaster. What does this mean in practice?

"The poor quality of information was only too tragically apparent two years ago when a fire broke out at Schiphol airport and unfortunately even more recently during the fire at the TU Delft Faculty of Architecture. In both cases, the fire brigade was not given the most up-to-date information on the state of the approach routes leading to the scene of the disaster. At TU Delft, for example, the partial road closure of *Papsouwse laan* and the complete road closure at the *Sebastiaanbrug* and *Mekelweg* meant there was only one approach route open, *Schoenmakerstraat*.

Information quality is not only a Dutch problem however. Various examples abroad, including the terrorist attacks in New York, Madrid and London, have shown that the current information system cannot keep pace with the demand for high quality information. The New York firemen, for example, had not been informed that part of the Twin Towers would collapse, the police on the other hand had.

Before being able to answer the question posed, we need to take a closer look at the different aspects of disaster and crisis management. Managing a disaster is an extremely complex, dynamic and unpredictable process that often crosses the boundaries of organisations and support information systems. In order to cope with the various sources and effects of a disaster effectively, it is essential that the different emergency services, i.e. the police, fire brigade and ambulance service, establish a continuous exchange of information. The problem is these individual services are not used to working directly together on a day to day basis, yet in the event of a disaster, they are expected to be able to mobilize a streamlined disaster manage-

ment network in an instant. Information is one of the most important resources during a disaster and the quality of this information affects the decisions and actions of the relief workers. For example, outdated information on the number of victims at the scene of a disaster can result in too few ambulances being sent out.

Extensive research is currently being carried out into improving the provision of information during disasters. Many of these research projects, however, are concentrating on innovative technologies and not taking sufficient account of relief workers' institutional environment, the organisation and their information needs. In the event of a disaster it is important that relief workers use the same systems that they use during their day to day activities. Relief workers find it difficult adjusting to a new information system during a disaster due to the immense time pressure. Consequently, many of the developed technologies are not adopted in practice despite the improvements they may offer.

Bearing these conditions in mind, my research focuses on how we can improve the adaptability of the current information systems. Adaptability here means being able to effectively coordinate the range of information with the demand for information under changing circumstances; an essential precondition for guaranteeing quality of information for relief workers. Adaptability demands not only greater flexibility but also greater intelligence. By intelligence I mean, for example, deploying the same kind of sensors with cameras or small robots as are currently being used in the military field.

Information orchestration (coordinating and improving information) is one of the ways to increase adaptability at both an organisational level as well as a technological level in disaster and crisis management. One idea may be to employ a number of information managers in the incident room who could coordinate and improve the data flow. The topic of my research, however, still poses numerous theoretical and practical challenges."