

MET News

Department of Civil Engineering

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Welcome

Welcome to the first issue of "MET News", the newsletter for the Master of Engineering in Transportation (MET) programme at Canterbury University. It's designed to report on our activities to both our industry sponsors and to potential students. We hope that you will find it interesting.

In only three years, the programme has developed a wide-ranging curriculum with a complement of four lecturers to support it. Enrolments from within the New Zealand transport industry and from overseas students have been strong, complementing the intake from our undergraduate programme. In the long term, we expect that this will help achieve the aims of a better skilled transportation workforce and a larger base of people to undertake work in this sector.

If you're interested in enrolling in the MET programme, supporting it in any way, or would just like to provide some feedback about this newsletter, please get in touch.

Assoc. Prof. Alan Nicholson
Programme Director



New Transport Landscape Influences Shape of MET Programme

In the past couple of years, significant changes have taken place at national policy level with regards to transport. Initiatives such as the Government's New Zealand Transport Strategy (Dec 2002), Land Transport Management Act (Dec 2003), and the Transport Sector Review (Jun 2004) will change the way that transport planning and implementation is done in this country. In particular, they signal an increasing emphasis on sustainable transportation and the promotion of all travel modes. Other developments such as the National Walking & Cycling Strategy and the Government buyback of the rail network also attest to this change.

The MET programme at Canterbury University is moving quickly to reflect this changing landscape. Programme Director, Associate Professor Alan Nicholson, says "The transport industry has been very vocal about ensuring that our courses meet the challenge of the new environment. In many

cases, the material has always been there; it just now needs to be set within the context of the new Government legislative and policy framework."

Planning and design for cycling for example is extensively covered in the advanced traffic management course, based on the training material developed for Transfund in 2003. It is hoped that pedestrian planning and design can also be incorporated into the curriculum, particularly once the LTSA complete their national pedestrian guidelines.

Other improvements to the programme are reflected by changes in technology. For example, this year for the first time a section on Intelligent Transport Systems (ITS) was introduced to one of the courses, with the assistance of a visiting academic. Students are also introduced to and work with the latest software in their courses, such as LTSA's Crash Analysis System (CAS),

and the Paramics microsimulation model.

"We don't ever expect to be able to stand still for too long," says Prof. Nicholson. "There are always a lot of developments going on in the transportation industry, and we will try to be on top of them in our programme. Indeed, hopefully through our research work, we can be at the forefront of many of them."



Visiting Professor Michael Bell (Imperial College, London) taught transport network reliability and Intelligent Transport Systems to this year's MET students.

Meet the Team

Over the past few years, the transportation group within Canterbury's Civil Engineering Department has grown from a "sole practice" to a team of four lecturers.

Alan Nicholson (Director of MET programme) has been with the Department for over 20 years, and has been an advisor to the NZ National Roads Board, Transit NZ and Transfund NZ on transport research. He has been a Visiting Fellow/Professor at several leading UK Universities, and has lectured on traffic safety and management in the UK, Australia, Iran, Jordan and Kuwait. As well as being recognised internationally for his expertise in road safety, Alan also has a strong interest in road network reliability, and the use of risk management and probabilistic methods in transportation engineering.



Andre Dantas received his PhD in 2002 from the Nagoya Institute of Technology, Nagoya, Japan, where he had also been a teaching assistant since April 1998. Prior to that, he was a GIS instructor at the University of Brasilia, and a traffic engineer and transportation planner in different parts of Brazil. Andre specialises on the development of Neuro-Geo-Temporal models for Transportation Planning using Geographical Information Systems (GIS), Remote Sensing (RS) and Neural Networks



Mofreh Saleh has been working within the roading industry for the past 13 years, with an emphasis on pavement management and maintenance. Mofreh has been a lecturer in the Department since his arrival in New Zealand in 2001. Prior to that, he had overseen major highway maintenance projects for the California Department of Transportation (Caltrans), and had been involved in several research projects at Arizona State University, where he received his PhD.



Glen Koorey graduated from Canterbury in 1994, and worked for Opus International Consultants in a number of roading/transportation roles, including road design, traffic surveys, crash analysis, and highway research. In 2001, he took study leave to pursue a PhD (investigating safety modelling of rural highways) at Canterbury. Earlier this year Glen was appointed as a Transportation Lecturer in the Civil Engineering Dept. He specialises in rural highway design/modelling, planning/design for cycling & walking, and road safety models.



In addition, the department also employs a research fellow in pavement design, **Bruce Steven**, and collaborates with **Assoc. Prof. Rob Douglas** in the School of Forestry on forestry transportation issues. **Dr Sabine Werkmeister**, from the Technical University of Dresden in Germany, has also recently joined the department for a two-year post-doctoral position investigating rutting in pavements. **Dr Seosamh Costello** from the University of Auckland also assists with teaching the pavement management course, while Dr Saleh reciprocates by assisting with Auckland's pavement design course.

Canterbury University is fortunate to be able to invite many respected overseas academics to visit here, courtesy of the Erskine Fund. In the past year, the MET programme has included teaching by **Professor David Boyce** (University of Illinois, Chicago; Urban and

regional transportation planning; Dynamic transportation system models for planning intelligent transportation systems), **Professor Martin Snaith** (University of Birmingham; Pavement design and road asset maintenance and management), and **Professor Michael Bell** (Imperial College, London; Transport network reliability, Intelligent Transport Systems).

A number of local industry experts also assist with the teaching in the programme, including Dr Shane Turner (BCHF), Dr Bryan Pidwerbesky (Fulton Hogan), Axel Wilke (Christchurch City Solutions), and Shaun Hardcastle (Traffic Design Group). We are grateful for their time and assistance.

Conferences and Visits

Alan Nicholson and Andre Dantas visited Brazil for three weeks in November 2003, where they presented papers and led workshops at the Conference of the Brazilian National Association for Transport Research. They also visited several universities to present seminars and lectures. It is hoped that this visit will result in Brazilian PhD students coming to the Department to undertake transportation research, with funding from the Brazilian Government.

In April 2004, Alan Nicholson visited Jordan and Syria as a keynote speaker at the International Conference on Sustainable Development of Transportation Systems. He also made two invited presentations (on 'Risk Management and Road Safety' and 'Transport Network Reliability') at a pre-conference workshop. His visit to Syria involved advising the Road Communication Directorate on traffic safety management on major highways, and led to his being asked to brief the Syrian Minister of Transport on the topic.



The road to Heaven or Hell? Alan Nicholson and a local guide contemplate a road-sign found in Syria, offering routes to Damascus and Baghdad...

In September 2003, Glen Koorey attended the IPENZ Transportation Group Technical Conference in Christchurch, where he presented two papers on sustainable transportation and safety auditing. Planning for cycling has also featured heavily in Glen's recent schedule, with presentations at three New Zealand conferences in the past year, as well as running practitioner training courses on the topic in Auckland, Christchurch and Dunedin.

Christchurch also played host recently to the Second International Symposium on Transport Network Reliability. Alan Nicholson and Andre Dantas were heavily involved as Chair and Secretary of the organising committee for this major conference, with Alan also presenting a paper.

Mofreh Saleh has made a couple of visits to North America recently to present papers; attending the U.S. Transportation Research Board Conference in Washington D.C. in January 2004, and more recently travelling in June 2004 to Saskatoon, Canada for a specialist conference of the Canadian Society for Civil Engineering.

Awards and Achievements

Congratulations to our most recent graduates, who graduated in May 2004. Eight students completed their MET degrees and another completed their postgraduate diploma.

In 2003, Mofreh Saleh and Bruce Steven succeeded in gaining substantial research funding from the Foundation for Research Science and Technology (FRST), as part of a project lead by Opus International Consultants. Dr Saleh also successfully completed the first stage of a research project on foamed-bitumen for Transfund NZ, which approved funding for the second stage of the research.

Alan Nicholson has been elected National Chairman of the NZ Institution of Professional Engineers (IPENZ) Transportation Group. This is one of IPENZ's largest Technical Interest Groups, with over 600 members in NZ and overseas.

At the Conference of the Brazilian National Association for Transport Research in Nov 2003, Alan Nicholson was awarded the prize for the Best Academic Paper at the Conference.

The prize for the best paper by a young engineer presented to the 2003 IPENZ Transportation Group Technical Conference was won by Grant Thomas, for his paper describing research (supervised by Alan Nicholson) on rural roundabout design. This paper summarised Grant's project report, which was awarded the Minister of Transport's Prize for the best student project report in 2002.

At the same Technical Conference, Glen Koorey won the prize for "Best Technical Note" for a paper on safety audits of existing road, and in late 2003, Glen was awarded the (Transit NZ / Works Infrastructure) "New Zealand Road Innovation Award" for earlier research into slow vehicle bays.



Recent MET students celebrate with Andre Dantas on graduation day, May 2004. From L to R: Chee Chang, Meng Kong, John Mao, Dr Dantas, Kung Loh.

Modelling Transport Network Effects

John Mao recently completed his MET research report entitled "Braess' Paradox in Reality - Cause, Consequence and Resolution". The report examines the special conditions in which improvements in the road network may result in additional costs in considerable excess of the expected benefits. Under Andre Dantas' and Alan Nicholson's supervision, John developed a method to identify the occurrence of such paradoxical effects. The method was applied to a case study in the area of the University of Canterbury and its surroundings.

One of the case study findings is that the current practice of road pricing (to achieve user optimality) may create more adverse effects than it solves. The current traffic pattern may be economically and politically the best solution, given implementation expense and opposition from motorists and politicians. The report was presented to the transportation planners and modellers of Christchurch City Council. The consequences of current modelling practices and future research improvements were discussed. John is currently working in the Civil Engineering Department as a research assistant, and is applying his method to the Christchurch Transportation Network.

For further information, please contact:

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Where Have Our Students Come From?

Interest to date in the MET programme has been quite wide-ranging, both in terms of local industry participants and students from overseas. Here is a sample of companies that our PART-TIME students are employed with while undertaking the MET programme:

- Bloxham Burnett & Olliver
- Connell Wagner
- Land Transport Safety Authority
- Opus International Consultants
- Transit NZ
- Christchurch City Council
- Dunedin City Council
- MWH
- Traffic Design Group
- Works Infrastructure

A number of FOREIGN students have also been attracted to the programme, having recently completed their undergraduate training overseas. Countries of origin for some of our students include:

China ~ Egypt ~ India ~ Indonesia ~ Phillipines ~ Romania ~ Serbia ~ Sri Lanka

Many of these students intend to stay on and obtain work here in New Zealand, thus helping to expand the pool of transportation engineers in this country.

Programme Sponsors

The University acknowledges the generous assistance of these agencies in supporting the MET Programme:



transport safety



Industry a key part of MET Programme

The MET programme arose out of a stated need by the New Zealand transportation industry to increase the number of university qualified transportation engineers. It was recognised that a key factor in its success would be regular feedback from the industry regarding the composition of the programme. To help achieve this, Canterbury has established a local Industry Liaison Committee, comprising expert transportation practitioners from around Christchurch covering a range of organisations and specialist areas. The committee meets with University staff twice a year to review the MET curriculum and consider ways to attract more people into the programme.



Liaison Committee meet with transportation staff in March 04. L to R: Dr Andre Dantas, Robin Odams (Transit NZ), Neil Bennett (Transfund), Dr Bryan Pidwerbesky (Fulton Hogan), Dr Mofreh Saleh, Mike Rudge (MWH), Prof. Alan Nicholson, Wayne Osmers (LTSA), Dr Shane Turner (BCHF), Glen Koorey. Absent: Stuart Woods (Chch City Council).

Recent Publications

- Chang, C.K. (2004), "Durability and fatigue life of open graded friction courses", MET Project Report, Univ. of Canterbury, Feb 2004, 90pp.
- Kong, M.H. (2004), "Bus service reliability: bunching and arrival time predictability", MET Project Report, Univ. of Canterbury, Feb 2004, 102pp.
- Koorey, G.F. (2004), "Cycling/Walking Safety from a National Perspective - New Thinking Needed", TRAFINZ Conf., Napier, Jul 2004.
- Koorey, G.F. (2004), "Assisting Walking and Cycling for Recreation and Transport", NZ Recreation Association Conference, Queenstown, Aug 2004.
- Loh, K.-A. (2004), "Traffic clustering", MET Project Report, University of Canterbury, 60pp.
- Mao, S. (2004), "Braess' paradox in reality: cause, consequence and resolution: a case study", MET Project Report, Univ. of Canterbury, Mar 2004, 58pp.
- Menzies, A. (2004), "Investigation of changes in speed behaviour resulting from the installation of a red light camera sign", MET Project Report, University of Canterbury, 49pp.
- Nicholson, A.J. (2004), "Evaluating Options for Improving Transport Sustainability", Proceedings of Jordan Engineers Association International Conference on Sustainable Development of the Transportation System (Amman), April 2004: 15pp.
- Nicholson, A.J. (2004), "Transport Network Reliability Evaluation", Proceedings of Jordan Engineers Association Workshop on Sustainable Development of the Transportation System (Amman), April 2004: 23pp.
- Nicholson, A.J. (2004), "Risk Management and Road Safety", Proceedings of Jordan Engineers Association Workshop on Sustainable Development of the Transportation System (Amman), April 2004: 16pp.
- Nicholson, A.J. (2004), "Transport Network Reliability Measurement and Analysis". Revista Transportes (in print).
- Roozenburg, A.P. (2004), "Investigation into Equations for Determining Passing Demand", MET Project Report, Univ. of Canterbury.
- Saleh, M.F. (2004), "New Zealand experience with Foam Bitumen Stabilization", Journal of Transport Research Board (in press).
- Saleh M.F. (2004), "Experimental Investigation of Foam Bitumen Stabilisation", Transfund NZ Research Report, Wellington (in press).
- Teo, N.W. (2004), "Mechanical properties of foamed bitumen stabilised mixes", MET Project Report, Univ. of Canterbury, Feb 2004, 65pp.