



Sustain10 Postgraduate Research Colloquium

Book of Abstracts

School of Natural and Built Environments

November 11-12, 2010

University of South Australia, Mawson Lakes Campus

Welcome from the Head of School

Welcome to another annual School of Natural and Built Environments Postgraduate Research Colloquium. The School contains a vibrant mix of four disciplines that cover the diverse aspects of both the built and natural environments. These disciplines include Civil Engineering, Construction and Project Management, Urban and Regional Planning, and Geospatial and Environmental Management. From this interdisciplinary platform, we aim to educate outstanding research-embedded practitioners and leaders and address research questions in key application areas using multi-disciplinary teams and strong international networks.

The School of NBE is becoming highly productive in terms of its research outputs and the School is particularly keen to support outcome-related research and development in our areas of demonstrated excellence. We also aim to support innovation to underpin future economic and social development in the communities in which NBE operates. To this end we are creating and supporting new interdisciplinary PhD programs. Only a few weeks ago it was announced that researchers in our School had secured three new highly competitive Australian Research Council (ARC) grants to investigate important topics such as sustainable buildings, permeable pavements and pollutants in water supply systems. These three grants will bring in even more PhD students to our existing cohort of over 50. Certainly the future of research is bright in NBE.

However, the purpose of this research colloquium is to celebrate the highly innovative and exciting postgraduate research occurring within the School today. In addition, this colloquium provides a significant and important opportunity to develop collaborations between and amongst our graduate students. Our PhD students and Masters (by research) students in 2010 contribute to a program where they produce a poster on their research in April and deliver a talk at their colloquium in November. The students come together in a congenial atmosphere to see the research of others, receive input from academics and relevant industry leaders, and to observe and discuss the development of research projects with students at different stages of the process.

The organising team is to be congratulated on developing such an exciting program that demonstrates the way in which NBE embraces cross-disciplinary research challenges while leveraging our core strengths. The energy behind this achievement is undoubtedly provided by the Students of NBE!

Professor Simon Beecham
Head of School of Natural and Built Environments
University of South Australia



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Colloquium Program

Thursday, 11th November

9.00am Registration

9.30am Welcome: Professor Jill Slay, Dean of Research, ITEE

9.40am Session 1: Chaired by Assoc. Head David Bruce

9.40am	Morteza Shokri Ghasabeh	PhD (Building)
10.00am	Rosmala Dewi	PhD (Civil Engineering)
10.20am	Chansiri Suksri	PhD (Transport Systems Engineering)
10.40am	Paul Corcoran	PhD (Geoinformatics)

11.00am Morning Tea

11.30am Session 2: Chaired by Assoc. Head Ian Clark

11.30am	Jaruwit Prabnasak	PhD (Transport Systems Engineering)
11.50am	Mohamad Hasim	PhD (Building)
12.10pm	Nicola Mosca	Masters (Transport Systems Engineering)
12.30pm	Tim Johnson	PhD (Civil Engineering)

12.50pm Lunch

1.40pm Session 3: Chaired by Dr Nicholas Chileshe

1.40pm	Rina Aleman	PhD (Environmental Management)
2.00pm	Steven Nothrop	PhD (Civil Engineering)
2.20pm	Li Meng	PhD (Transport Systems Engineering)
2.40pm	Cathryn Hamilton	PhD (Planning)
3.00pm	Ying Yan Qu	PhD (Civil Engineering)

3.20pm Afternoon Tea

3.40pm Session 4: Chaired by Professor Chris Daniels

3.40pm	Shuaifei Zhao	PhD (Civil Engineering)
4.00pm	Chris Raymond	PhD (Environmental Management)
4.20pm	Reazul Ahsan	PhD (Planning)
4.40pm	Branko Stazic	PhD (Transport Systems Engineering)

5.00pm Closing for Day One: Shuaifei Zhao and Philip Roetman

Colloquium Program

Friday, 12th November

9.00am **Registration**

9.30am **Welcome to Day Two: Professor Andrew Parfitt, Pro Vice Chancellor ITEE**

9.40am **Session 5: Chaired by Assoc. Professor Julie Mills**

9.40am	Susan Irvine	PhD (Planning)
10.00am	Chunqi Lian	PhD (Civil Engineering)
10.20am	Michael Van Alphen	PhD (Environmental Management)
10.40am	Jintawadee Suksri	PhD (Transport Systems Engineering)

11.00am **Morning Tea**

11.30am **Session 6: Chaired by Dr Don Cameron**

11.30am	Philip Roetman	PhD (Environmental Management)
11.50am	Juan Yang	PhD (Civil Engineering)
12.10pm	Susilawati	PhD (Transport Systems Engineering)
12.30pm	Paul Atem	PhD (Planning)

12.50pm **Lunch**

1.40pm **Session 7: Chaired by Professor Simon Beecham**

1.40pm	Gusri Yaldi	PhD (Transport Systems Engineering)
2.00pm	Chathurika Wella Hewage	PhD (Civil Engineering)
2.20pm	Zainul Baharuddin	PhD (Planning)
2.40pm	Ivan Iankov	PhD (Transport Systems Engineering)

3.00pm **Election of 2011 Postgraduate Student Representatives**

3.15pm **Closing Remarks and Awards: Head of School, Professor Simon Beecham**

Organising Committee

Mr Philip Roetman, PhD candidate

Shuaifei Zhao, PhD candidate

Professor Chris Daniels, Director of Research

Ms Natalie Iglío, Project Officer: Research

Presentation Abstracts



Name: Morteza Shokri Ghasabeh
Degree: PhD Building
Supervisors: Assoc. Professor George Zillante
Dr Nicholas Chileshe
Project title: Lessons learned based bid no bid decision for Australian construction contractors

Barriers to lessons learned documentation from Australian contractors' perspective

Abstract:

A research study is being undertaken at the University of South Australia based on the introduction of a new bid / no bid decision, namely "Lessons learned based bid / no bid decision", to Australian construction companies. The research study has been undertaken through conducting an extensive literature review of the bid / no bid decision and also the organizational lessons learned. Moreover, the researchers have conducted a national survey in which seventy-nine Australian construction contractors (ACCs) participated. As part of the research study the researchers made an effort to discover what percentage of ACCs document their projects' lessons learned. In addition, an investigation was undertaken to ascertain why ACCs don't make more attempts to document the lessons they learned from their projects. The survey showed that merely one third of the ACCs document their lessons learned regularly despite the fact that most of them believe it is useful to possess a lessons learned document. Furthermore, it was discovered that ACCs do not make a greater effort to document the lessons learned due to some barriers, most importantly the ACCs' lack of employee time and resources. The result of this survey was also compared with the result of similar surveys conducted in other countries. Finally, most of the ACCs concluded that the results of lessons learned documentation will be incorporated as an input to their future bid / no bid decision making process which enables them to select more feasible projects for which to bid. The findings of this survey help ACCs to understand the importance of lessons learned documentation and identify the barriers to effectively document their lessons learned.

Notes:



Name: Rosmala Dewi
Degree: PhD Civil Engineering
Supervisors: Dr John Van Leeuwen
Mr Andrew Averson
Assoc. Professor Christopher Chow
Project title: Optimized bio-treatment of pulp and paper mill (KCA, Millicent, SA) wastewaters

Comparison of raw and pre-treated pulp and paper mill effluent in a laboratory-scale secondary aerobic lagoon treatment system

Abstract:

Secondary Aerobic Lagoons (SAL) are commonly used for biological wastewater treatment of effluents from the pulp and paper industry. The operation of these systems is relatively straightforward and generally requires minimal monitoring and control, which render them as an economical wastewater treatment option. However, the effluent produced from this treatment process may lead to variable improvements based on different wastewater quality parameters. For example, SAL can achieve high removals of BOD₅ (>90%), moderate removal of COD but may provide for minimal reduction, if any, in colour and some nutrients. Hence, other treatment options may need to be considered and adopted in order to optimize the overall treatment process. The study reported on here aims to optimize the treatment of wastewaters from a pulp and paper mill by conventional coagulation followed by a SAL treatment system. The SAL comprises a continuous stirred tank reactor, plug flow tank and stabilization tank, operated in sequence. The removals of BOD, COD, TN, TP and colour were investigated. The results indicate that the use of coagulation by alum as a pre-treatment step to SAL allows for high percentage removals of phosphorus and colour and significant percentage removals of COD. However, by this process there is insufficient removal of BOD₅ and consequently biological treatment, such as SAL, is needed. For reduction of BOD₅ to low levels, sufficient nutrients are required to support microbial activity for degradation of the organics that are responsible for the BOD₅. This requires either management of the coagulation process to ensure sufficient P remains present or addition of P to the post coagulated wastewater.

Notes:



Name: Chansiri Suksri
Degree: PhD Transport Systems Engineering
Supervisors: Professor Michael Taylor
Dr Wen Long Yue
Project title: Advanced congestion management using traffic signal control

Effects of electric vehicles on traffic signal control systems

Abstract:

The Transport sector is a noteworthy and growing source of greenhouse gas emissions. To reduce emission levels, major behavioural and technological changes will be required. One major change expected is an increase in the uptake of electric vehicle technology. When stable technology is available, electric vehicles may substitute for the typical passenger cars of today, particularly for short trips. Generally, short trips occur in urban networks where signalized intersections perform as a bottleneck, an issue for flow management. During the twentieth century, signal control systems were implemented to control and manage traffic flows in most urban areas before the occurrence of electric vehicles. This presentation will introduce how a future increase in the electric vehicle fraction may require alteration of the existing traffic control systems.

Notes:



Name: Paul Corcoran

Degree: PhD Geoinformatics

Supervisors: Assoc. Professor David Bruce
Dr Steve Carver

Project title: An evaluation of the availability, accessibility and applicability of spatial information in South Australia with regard to the management of Indigenous lands and waters

The accessibility of map data from the internet for Indigenous Lands and Waters management projects in South Australia, Australia

Abstract:

To further the use of mapping (including GIS) within Indigenous communities, map data needs to be readily accessible and that tends to mean via the Internet. This paper evaluated this accessibility for Indigenous lands and waters projects in South Australia; a State residing in one of the best performing nations for e-government. However, the term 'map' has become staid and this has been amplified by the GIS industry as 'map' has gradually been substituted with a variety of nomenclatures e.g. spatial data/ information. Consequently, to ascertain accessibility to relevant websites, these new terms were used and entered into five search engines. Traditional Information Retrieval techniques such as Precision and Relative Recall were used to analyse the websites returned, but in addition, further analysis was conducted to establish website ranking, frequency, industry sector, number of clicks to download and finally the usefulness of the map data acquired. 68/300 websites visited were relevant with the majority being government (the most popular was PIRSA). However, the most intriguing finding was not the websites that were returned, but more the government departments and agencies that were not returned as popular hits; e.g. Geoscience Australia (GA) and Department of Environment and Heritage (DEH). This study interpreted that their unpopularity could be attributed to the use of 'map' as a key word in their service. This study concluded that spatial data/ information was accessible to an extent, but suggested that if Australia's GIS industry wished to make it more widely accessible, they should consider adopting GA and DEH's approach of using a more public friendly term, dust off the old image of 'map', build upon its familiarity, highlight the cutting edge technology within and, in a sense, go 'back to the future'.

Notes:



Name: Jaruwit Prabnasak
Degree: PhD Transport Systems Engineering
Supervisors: Professor Michael Taylor
Dr Wen Long Yue
Project title: An investigation of the vehicle ownership in medium-sized city in Thailand

An estimation of greenhouse gas emission generated by urban transportation sector in those mid-sized cities in Thailand

Abstract:

Climate change is one of the greatest concerns in the modern world. As we know, a considerable proportion of greenhouse gas emissions causing the crisis comes from urban transportation sector. In Thailand, it seems that there is only one mega-generator of greenhouse gas emissions in urban transportation sector which is Bangkok. In fact, there are many mid-sized cities around the country which also act as lighter generators and the sum of these generators could likely produce a significant amount of greenhouse gas emissions as well. This presentation demonstrates a rough approximation of greenhouse gas emissions generated by the urban transportation sector in those mid-sized cities based on a recent data collected in a mid-sized city named Khon Kaen City. A unit of greenhouse gas emissions produced per person estimated from the data is used to predict total emissions generated from all other mid-sized cities in Thailand.

Notes:



Name: Mohamad Hasim

Degree: PhD Building

Supervisors: Dr Stephen Pullen
Dr Alpana Sivam

Project title: A Framework for the Adoption of Sustainable Asset Management in Universities in Developing Countries

A framework for the adoption of sustainable asset management in universities in developing countries

Abstract:

Traditional asset management practices have been linked with numerous problems that can affect an organisation's goals, retard business development, increase social tension and cause a detrimental impact to the environment. To avoid these negative impacts, sustainable practices must be considered. However, there is a lack of knowledge about sustainable asset and facilities management, especially in developing countries, and there is no consensus on the level implementation of such practices between developed and developing countries. Indeed, the achievement of sustainable development goals needs participation, integration and collective efforts from both developed and developing countries. The aim of this research is to determine the feasibility of incorporating sustainability principles in asset management practices in developing countries, with a focus on the facilities management phase. A study will be conducted in developed (Australia) and developing (Malaysia) countries using university organisations as a case study approach. Four study stages will be created combining both quantitative and qualitative methods such as website reviews to provide an initial benchmark and a questionnaire survey to establish the extent of sustainability practices. Supplementary interviews will be used to gain an in-depth explanation on sustainability practice and finally, a workshop with experts to assess framework's validity, relevance and applicability. The possible result of this research will be to assist developing countries in the establishment of a sustainable asset management framework. Specifically, it is important to university decision makers in measuring and benchmarking their efforts to achieve sustainable practices regarding the built environment.

Notes:



Name: Nicola Mosca
Degree: Masters Transport Systems Engineering
Supervisors: Dr Rocco Zito
Dr Ettore Stella
Project title: Future Urban Transportation Service

Future urban transportation service: the vision to drive us into the future

Abstract:

Improving mobility and decreasing traffic congestion is an important objective in today's society, and can help to achieve both a better quality of life and better productivity. Accurate and reliable positioning systems, also known as Automatic Vehicle Location (AVL) systems, allow fleet management systems to achieve better planning and scheduling outcomes. More importantly, better fleet management solutions can help users gain confidence in the use of public transport which is very often seen as inefficient, slow and unreliable. In order, to obtain better positioning, the research is studying the integration of different positioning systems, such as GPS, inertial sensors, and the applicability of computer vision techniques. The main outcome of the project will be to highlight possible future scenarios in transportation services and their dependence on accurate and reliable positioning. But in order to find a better solution, it is necessary to show what can be achieved today and what can likely be obtained in the near future. This presentation will therefore focus the attention on project objectives, the description of current state of the art, and the proposed methodology that is being applied to develop better AVL systems for public transport applications, and with some preliminary test results presented.

Notes:



Name: Timothy Johnson
Degree: PhD Civil Engineering
Supervisors: Dr Don Cameron
Dr Gregory Moore
Project title: Trees, Stormwater, Soil and Civil Infrastructure:
Synergies for Sustainable Urban Design in a
Changing Climate

Data – more is better!

Abstract:

Typical footpath construction seals soil surfaces, restricting tree root development and potentially inducing conflicts between street tree roots and civil infrastructure. Pervious pavement technologies increase access of rainfall and exchange of gases at the soil surface, potentially improving soil conditions for tree root growth. Eighteen field trials were constructed in 2009 and planted with *Pyrus calleryana* ‘Chanticleer’ to support investigation of this potential. Sixty three bores enable regular monitoring of soil moisture and oxygen levels to depths of three metres. Simultaneously recorded data on tree dimensions, leaf conductance, leaf stem xylem sap pressure, leaf area and climatic conditions allows investigation of multiple relationships between the trees, soil and infrastructure. Two pervious pavement designs and a control of impervious concrete block paving are being investigated, with six replicates of each. One design has a level interface between the porous base materials and natural soil, the other is formed into a swale parallel to the kerb. It is anticipated that the porous screenings beneath pervious pavements will, in Adelaide’s semi-arid environment, discourage the development of shallow roots by desiccating rapidly after rainfall. Non-destructive excavation of each trial following the three year monitoring period will enable investigation of the nature and depth of root development in relation to the two designs, to assess the potential of pervious pavements to reduce conflicts between tree roots and civil infrastructure.

Notes:



Name: Rina Aleman
Degree: PhD Environmental Management
Supervisors: Dr Fleur Tiver
Ms Joan Gibbs
Dr Phil Ainsley
Project title: Seed biology and germination requirements of *Brachyscome* species in South Australia

Germination requirements of *Brachyscome* species in South Australia

Abstract:

The *Brachyscome* genus is a small daisy in the family Compositae (Asteraceae), and is found throughout Australia. Many *Brachyscome* species have conservation significance, and are at risk of becoming extinct in the wild. In South Australia some of the native endangered species include *B. diversifolia*, and *B. muelleri*. The conservation of these plants requires knowledge of the seed biology and the germination requirements of individual species, because many have poor germinability and require treatments or specific conditions to break seed dormancy. The aim of this research was to determine the best germination treatment (gibberellic acid, potassium nitrate or smoked water) and the optimum season for germination for a range of *Brachyscome* species. Sixteen different *Brachyscome* species found in different locations were subjected to three different chemical treatments: gibberellic acid, a naturally occurring plant hormone; potassium nitrate, a germination stimulant found in the soil; and smoked water which simulates the chemical effects of a fire – also a germination stimulant. Seeds were then placed in incubators to germinate at summer, spring/autumn, or winter temperatures. Overall, gibberellic was the best germination stimulant. Smoked water and potassium nitrate did not have a significant influence on seed germination. Winter was the season that most species had highest germination rates. However, many seedlings were small and had short roots after germinating at winter temperatures. Most species did not have a high germination rate across all seasons, which indicates that the seeds could be conditionally dormant. Further research will be carried out to after-ripen seeds so that they become non-dormant, and germinate across a wider range of temperatures.

Notes:



Name: Steven Nothrop
Degree: PhD Civil Engineering
Supervisors: Dr John Van Leeuwen
Professor DongSheng Wang
Assoc. Professor Christopher Chow
Mr Andrew Everson
Project title: Development of Coagulation and Sludge Processing for Optimized Treatment of Magnefite Pulp and Paper Mill Wastewater

Polyamines and aluminium sulphate for the treatment of Magnefite Pulp Mill Wastewater

Abstract:

This research, jointly funded by UniSA and Kimberly-Clark Australia (KCA), will consider the effectiveness of coagulation (including novel coagulants) and flocculation for cost efficient and effective removal of colour, BOD, organic carbon, phosphorus and nitrogen from the KCA wastewaters. The potential applicability of the above treatment will be evaluated for integration prior to treatment utilizing the ASB system for biological stabilization of the wastewater. When implemented for full scale operations the KCA #1 Clarifier is proposed for conversion to a coagulation/flocculation clarifier. Also to be researched is the effectiveness of drainage aid applications for efficient dewatering of the sludge that will be produced and utilising the existing KCA Fukoku Kogyo Company (FKC) Rotary Screen Thickener and Screw Press.

Notes:

2010 Postgraduate Research Colloquium

Name: Li Meng
Degree: PhD Transport Systems Engineering
Supervisors: Professor Michael Taylor
Professor Steve Hamnett
Project title: The development of discrete choice model solutions for a low density rail corridor

Abstract:

Transit-oriented development (TOD) is becoming an essential notion for metropolitan cities. Most TOD research has focused on high density regions. There is lack of discussion on how TOD can be utilised in lower density regions. This research will discuss the potential use of discrete choice models in the assessment of TOD in otherwise low density suburban areas, using the case study of the northern rail corridor (from Mawson Lakes to Gawler) in Adelaide. Initial investigations of environment, travel patterns and socio-economic factors in the Mawson Lakes development have suggested that a number of factors may hamper the development of plausible TOD features, including a lack of mixed land use, walking and cycling facilities, urban street design issues, and residential and employment densities. These factors help explain the observed characteristics of local travel behaviour and are being included as key elements in data collection for the development of discrete choice models of travel mode choice and residential location choice. Great care needs to be taken in the design of the models in regards to the revealed data, stated preference data survey formulation and choices of the optimum alternatives and attribute sets. The study is in the data collection design stage. The expected model results should provide an advanced tool for analysing the likelihood of successfully achieving a TOD in the northern rail corridor, and may possibly be extended to other parts of metropolitan Adelaide and other Australian cities.

Notes:



Name: Cathryn Hamilton

Degree: PhD Planning

Supervisors: Assoc. Professor Jon Kellett
Professor Steve Hamnett

Project title: Mechanisms for local government to support carbon neutral households

The role of local government in community carbon reduction

Abstract:

Local government is the level of government that is closest to the community. Its role to support the community to reduce carbon emissions, however, has not been well defined. What are the roles that local governments are taking to support community carbon reduction, what does this tell us about climate change governance at the local level? Examples from eight case studies across three countries are used to support research findings that the role of local government within climate change governance frameworks needs to be better defined, acknowledged and communicated, both internally and externally, to build capacity for community carbon reduction.

Notes:



Name: Ying Yan Qu
Degree: PhD Civil Engineering
Supervisors: Professor Simon Beecham
Dr Terry Lucke
Project title: Modelling of Unsteady Flows in Siphonic Roofwater Harvesting Systems, and the presentation is Measuring Flowrates in Partially-filled Pipes in Siphonic Roof Drainage Systems

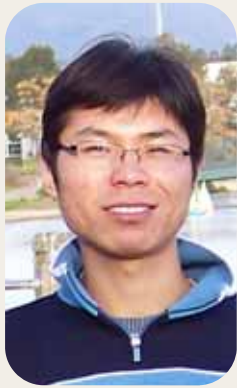
Measuring flowrates of partially filled pipes in siphonic roof drainage systems

Abstract:

While a variety of flow measurement devices are available to measure the volume of water flowing through closed pipe systems, these devices generally only function correctly when the pipes are completely full of water. Accurate measurement of flow volumes in partially filled water pipes, such as those found in roof drainage system pipe work, is extremely difficult. Part-full pipe flow conditions are effectively open channel flows. Current meters are often used to measure the flow velocity in open channels and the velocity/area method can then be used to estimate the channel flowrate.

This research describes an ongoing experimental study on estimating the volume of stormwater runoff flowing through a siphonic roof drainage system using a modified version of the velocity/area method. Modelling steady, pipe-full siphonic flow is quite well understood and relatively straightforward. However, attempts to model unsteady flow situations, such as when the drainage pipes are filling at the beginning of a storm event, have been less successful. To address this issue, a current meter and a pressure transducer were installed inside a section of 150mm diameter pipe to estimate the flowrates in the pipe. The readings from the current meter and transducer were analysed by a computer model and compared to known flowrates. Preliminary testing results have been very positive. The flowrate information produced in this study will ultimately be used to improve the design of siphonic drainage systems and will also be used to model stormwater harvesting and reuse options.

Notes:



Name: Shuaifei Zhao
Degree: PhD Civil Engineering
Supervisors: Assoc. Professor Linda Zou
Professor Dennis Mulcahy
Project title: Feasibility study of using forward osmosis to achieve high

Brackish water desalination by forward osmosis and nanofiltration: effects of temperature on process performance

Abstract:

Over the past 40 years reverse osmosis (RO) has drawn increasing attention in water desalination because of its excellent separation capability. However, RO is still facing the problems of high energy and cost inputs, as well as low water recoveries partly due to membrane fouling. To mitigate these problems, this study presents a novel system combined by forward osmosis (FO) and nanofiltration (NF) for inland brackish water desalination. This hybrid FO-NF system can help achieve the objectives of saving energy, achieving high water recovery and thus minimizing brine volume. In the current study, local brackish water with total dissolved solids of 3970mg/L was firstly desalted by FO at different temperatures. The effects of temperature on FO performance in terms of permeate fluxes, system recoveries, membrane fouling and cleaning effects were investigated. Bench-scale experiments showed that at 45°C the water recovery could be up to 97.00% after 28-h FO permeation. After FO, the diluted draw solution was treated by a two-stage NF to produce pure water, which was found to have met the drinking water standard of World Health Organization (WHO). The proposed FO-NF system has the potential to achieve higher overall water recovery and less energy inputs if it is operated continuously for longer time or under optimal process design.

Notes:

2010 Postgraduate Research Colloquium

Name:	Chris Raymond
Degree:	PhD Environmental Management
Supervisor:	
Project title:	Targeting environmental management based on landholders' native vegetation planting behavior: Socio-psychological and spatial dimensions

Targeting environmental management based on landholders' native vegetation planting behavior: Socio-psychological and spatial dimensions

Abstract:

Notes:



Name: Reazul Ahsan

Degree: PhD Planning

Supervisors: Assoc. Professor Jon Kellett
Dr Sadasivam Karuppanan

Project title: Climate change; changing the urban planning policy and system: a study of Bangladesh

Climate change; changing the urban planning policy and system: a study of Bangladesh

Abstract:

Urban service facilities and land dynamics have always been influenced by internal migration (rural-urban). Internal migration processes are induced by economic pull, social push or environmental degradation. Over the last few decades a variety of climatic hazards have introduced a new form of migration called climate migration or displaced communities due to climatic hazards. Migration of climate displaced communities can have a direct impact on the livelihood of those migrants and the land-use dynamics of their destination. The low-lying coastal regions of Bangladesh are highly prone to natural disasters and such climatic actions change the population dynamics and distribution. In the last few decades frequent floods, cyclones, drought and river erosion have exerted dramatic impacts on coastal settlements and livelihoods. Most recently cyclone SIDR(November 20, 2007) hit the south coastal region leaving 4234 people dead and destroyed 564,000 homes resulting in 885,280 people becoming homeless. Every year low-lying coastal areas are affected by, on average, six tropical cyclones accompanied by 5 to 6m high tidal surge killing thousands of people and causing extensive damage to houses and infrastructure and millions become homeless and displaced from their land. Those displaced communities are forced to migrate to other places and in most cases to the nearest urban areas to seek an alternative livelihood. They often settle at the urban fringe, on vacant lands beside rail lines and highways and squat around the city, thus changing the land use dynamics of the city. This research work is working on how climate change process changing the urban planning pattern and land use dynamics as tertiary impact by inducing forced migration or displacement.

Notes:



Name: Branko Stazic
Degree: PhD Transport Systems Engineering
Supervisors: Professor Michael Taylor
Dr Wen Long Yue
Project title: Linking macro level strategic transport forecasting models and traffic microsimulation models to enhance transportation analysis process

Investigating traffic network performance benefits with the replacement of conventional petrol vehicles with the electric vehicles

Abstract:

Due to electric vehicles likely to have smaller physical attributes, such as vehicle length and width it is expected that the substitution of conventional vehicles with the electric vehicles could have a positive effect on overall traffic network performance. For instance, the use of shorter vehicles would result in shorter queue lengths at the signalised intersection leading to lower vehicle delays. Another possible benefit of electric vehicles is related to their potential superiority in dynamics performance, such as acceleration and deceleration which could be translated in higher intersection throughput.

The benefits of electric vehicles in traffic stream were investigated using microsimulation software Aimsun and model of Goodwood Rd in Adelaide. The model of the Goodwood Road was developed between South Terrace, Adelaide, and Edward Street, with total distance of around 4.5 kilometres. The model includes all the signalised intersections and pedestrian crossings as well as the tram level crossing.

Electric vehicle dynamics attributes were developed based on real life travel time runs. Data was collected using the instrumented electric vehicle equipped with a GPS unit.

Notes:



Name: Susan (Sue) Irvine

Degree: PhD Planning

Supervisors: Dr Lou Wilson
Professor Steve Hamnett

Project title: Integrating Lifetime Affordable Housing in
Transit-Oriented Development

**ARC funded linkage project, Lifetime Affordable Housing in Australia:
*Integrating environmental performance and affordability***

Abstract:

Due to a range of economic, political and demographic influences in recent decades, Australia is experiencing a severe shortage of affordable housing. This needs to be addressed in a context of looming resource shortages and climate challenges which will leave lower-income households vulnerable to the rising cost of electricity to heat and cool their houses and petrol to access their work, schools, shops and other services. Transit-Oriented Development, or TOD, is an alternative form of urban development on a rising star. Since a successful TOD can deliver a wide range of benefits, the concept appeals to governments responsible for adapting unsustainable, car dependent cities as well as tackling the major issue of housing affordability. If TODs can be designed to significantly increase the use of public transport, walking and cycling, and increase housing options for all income levels close to good transit, jobs and amenities, the outcome would be great. But can it be done? This presentation looks at what we mean by both affordable housing and 'lifetime' affordable housing, and in particular examines recent moves in the United States to redefine affordability as a combination of both housing and transport costs. Research shows that some households located in transit-poor, outer urban areas pay as much, or even more, for transportation as they do for housing. A new tool, an index which reveals the actual, combined cost of housing and transportation in given locations, now covers 80 percent of the US population. It is set to be adopted at the Federal level to guide policy and practice in the traditionally unintegrated realms of housing and transport.

Notes:



Name: Chunqi Lian
Degree: PhD Civil Engineering
Supervisor: Professor Simon Beecham
Project title: Permeable concrete

Modelling mechanical behaviour of permeable concrete

Abstract:

With the increasing popularity of pervious concrete as a pavement material, researchers and concrete manufacturers have paid more attention to research needs. Pervious concrete is currently used in low traffic volume areas such as parking lots, footpaths and driveways. This is because it generally has lower strength than conventional concrete. This paper aims at developing a computational model to simulate the behaviour of pervious concrete under compression. Since compressive strength is one of the most important properties for concrete, a virtual model will provide a better understanding of its mechanical performance, which in turn will improve both the mix design and the material strength in the future. The discrete element method was applied and the results of calculations based on particle flow analysis are compared to the experimental data.

Notes:



Name: Michael Van Alphen
Degree: PhD Environmental Management
Supervisors: Professor Andrea Gerson
Professor John Cann
Project title: Risk related characteristics of asbestos

Asbestos: what is your lifetime risk of death?

Abstract:

Who says one asbestos fibre will kill you? This phrase exploits the fundamentals of cancer, where there is no '*low dose threshold*'. No matter how small the exposure there is a finite, attributable, lifetime risk of death. The popular 'one fibre' phrase is somewhat contrary to observation that 'typical' urban human lungs contain asbestos fibres at > 1000 fibres/gram of dry lung tissue. The conventional wisdom of toxicology suggests that the more asbestos fibres you inhale the higher the probability of death. This is the dose : response effect. The fibre concentrations in air, the durations of exposure and the age at first exposure are major factors in lifetime risk. So what is an acceptable lifetime risk of death due to incidental, domestic or passive exposure to asbestos? And what are the actual risks? Are they one person in a million or one person in ten thousand? The detection limit for the measurement of asbestos fibres in air has a major part to play in asbestos quantitative risk assessment. The current air monitoring method widely employed in Australia has a detection limit of 10,000 fibres per cubic metre of air; which is inadequate in any setting where there may be lifetime exposures. In the absence of high quality asbestos in air monitoring data; and particularly where potential exposures occur in settings you occupy with high frequency, your best defence may be to believe that one fibre will kill you. A risk calculator and the implications of such tools are discussed in relation to the prioritisation of asbestos fibre risk scenarios for attention and the broader need for quantitative risk assessment to protect public health.

Notes:



Name: Jintawadee Suksri
Degree: PhD Transport Systems Engineering
Supervisors: Dr Raluca Raicu
Dr Wen Long Yue
Project title: Sustainable urban freight distribution

The use of electric vehicles and urban consolidation centres in urban freight distribution

Abstract:

Over recent decades the negative impacts of the delivery and collection of goods in urban areas has become a topical issue with the rapid growth of urban freight transport. The growth of freight traffic in urban areas results in considerable environmental, accessibility and safety issues. A number of studies and on-going projects have been looking at urban goods distribution, predominantly in Europe and Japan where several measures or initiatives have been implemented to improve the efficiency of operations and reduce negative impacts.

This presentation will introduce previous research on sustainable urban freight distribution initiatives followed by a case study. A summary of major existing initiatives and measures proposed or implemented will be presented. The case study of urban freight distribution in the city centre of Adelaide, South Australia will be briefly introduced with some preliminary observations. Particular interest will be paid to the use of electric vehicles and urban consolidation centres for urban freight distribution. The potential costs and benefits involved in the operation, with examples of the experiment or implementation in other countries will also be presented.

Notes:



Name: Philip Roetman

Degree: PhD Environmental Management

Supervisor: Professor Chris Daniels

Project title: Using Citizen Science to study Citizen Science: an analysis of attitudes and behaviour towards wildlife in South Australia and the benefits of community involvement in research

Understanding developmental changes to a Citizen Science program

Abstract:

Citizen Science is rapidly developing as a research methodology where professional researchers engage the public to collect data within a cooperative framework of research and education. My research is focussed on Citizen Science and how scientists can use this methodology to collect data and educate and engage the wider community. One aspect of this work is the development of a Citizen Science program, which I have been involved with over four years and involving four discreet projects. These projects have focussed on local wildlife species: bluetongue lizards, possums, Australian magpies, and spiders. The response of participants to these four projects has been different each year in three important ways. First, the response rates to online survey instruments used for data collection have been different, in both the total number of participants and in when they have participated during a project. Second, utilisation of the education resources has increased and school participation has been an important source of new project participants. Third, new methods to recruit participants have been used, including internet-based social networking. Understanding these changes adds to the theoretical knowledge of the process of Citizen Science.

Notes:

Name: Juan Yang
Degree: PhD Civil Engineering
Supervisor: Assoc. Professor Linda Zou

Project title: High-performance and cost-effective carbon electrode materials for the capacitive deionization (CDI) process

Capacitive deionization (CDI) performance enhanced by using porous carbon/MnO₂ composites as the electrode material

Abstract:

Mesoporous carbons were synthesized using commercial available mesoporous silica as hard templates. The further Carbon/MnO₂ composites were prepared by a co-precipitation method utilized a redox reaction between KMnO₄ and MnSO₄•H₂O. The prepared materials were characterized by X-ray diffraction (XRD), high resolution transmission electron microscopy (HRTEM) and nitrogen sorption/desorption at 77K (BET, t-plot, α s-plot), X-ray photoelectron spectroscopy (XPS). Results show that a crystallized MnO₂ layer homogeneously dispersed on the walls of porous carbon which resulting a decrease of BET specific surface area, pore volume and pore size. The electrosorption capacitance of the porous carbon and its MnO₂ composites were investigated by cyclic voltammetry in 1 M NaCl aqueous solutions. The obtained mesoporous material with high surface area and proper pore size distribution that favoured the formation of electrical double layer (EDL) capacitor exhibited high capacitance. Specially, capacitance of mesoporous carbon materials was 151.72 F/g that markedly higher than that observed from the activated carbon (98.64 F/g). Besides, the electrosorption capacitances were further enhanced with the assistance of transmitted metal oxide film which has a good surface adsorption property of the electrolyte cations and assures an effective cation intercalation within the electrode materials. A high capacitance up to 204.37 F/g for the carbon/MnO₂ composite material under the same investigation condition was a good demonstration. Lastly, capacitive deionization (CDI) performances were studied. The amount of salt removal increased from 10.25 μ mol/ g for the mesoporous carbon to 11.87 μ mol/ g for its MnO₂ composites, which were greatly higher than the 4.3 μ mol / g for the activated carbon (AC).

Notes:



Name: Susilawati (Susi)
Degree: PhD Transport Systems Engineering
Supervisors: Professor Michael Taylor
Dr Sekhar Somenahalli
Project title: Travel time reliability study for Adelaide road networks

Travel time reliability and bimodal travel time distribution for an arterial road

Abstract:

In relation to the development of travel time reliability metrics, previous studies had suggested that the travel time variability distribution might follow either normal or lognormal forms. From substantial new data observation undertaken in Adelaide, including assessment of two sets of longitudinal trip time data, these distributions appear inadequate. Generally this is because the upper tails of the observed distributions are more substantial than those of the normal or lognormal distributions. Additionally, there is some evidence of bimodality in some of the actual travel time distributions. Consequently, a number of questions arise: when does bimodality occur? How does it affect the measurement of travel time variability and reliability? Hence, this paper investigates the existence of bimodality in travel time distributions and tries to answer those questions. From the data it was found that the bimodality happened when travel time observations for a given link actually belong to two different populations. This occurs on links with traffic signals, in circumstances when the traveller experiences two distinct modes of traffic behaviour: (1) when there is no delay at the traffic signals and (2) when the traveller encounters a long delay. Bimodality is known to occur in other fields, such as the life test process in reliability engineering. The paper uses current research to measure the probability of the separate populations. Using the Mixture Normal distribution functions, we can then refine and extend the previous travel time reliability metrics.

Notes:



Name: Paul Atem

Degree: PhD Planning

Supervisors: Dr Lou Wilson
Dr Andrew Allan

Project title: Australian housing affordability crisis: Its implication on Sudanese refugees' housing and settlement in South Australia

Analysis of the housing situation of African residents in Adelaide, South Australia: Survey results

Abstract:

The African community in Australia is growing but their access to housing is limited. Access to housing is crucial for durable settlement and economic integration as housing provides not only space, energy, and accommodation, but also enhances opportunities to participate in the workforce. This presentation will detail survey results regarding the impacts of Australia's housing affordability crisis on African residents' settlement in Australia. This housing analysis covers a survey of migrants from nine African countries residing in Adelaide, South Australia. The survey results demonstrate that the majority of the respondents live in disadvantaged suburbs in the Adelaide metropolitan areas and that recent housing market shifts had influenced African migrants' movements to such disadvantaged and marginalised areas. It appeared almost impossible for African residents to access homeownership or live in affluent suburbs in Adelaide. The African respondents had identified insufficient income as major contributing barrier for their access to suitable housing and the mean two-weekly income for the households was relatively low. However, the survey results suggest that the integration of the African migrants' in South Australia from their own perspective remains unaffected despite their difficult experiences in finding suitable and affordable housing in the Adelaide metropolitan area. Therefore, there is a need for intervention that aims at addressing African migrants' situation preventing deterioration and risk of homelessness among the most disadvantaged African members and also tackles related economic issues.

Notes:



Name: Gusri Yaldi
Degree: PhD Transport Systems Engineering
Supervisors: Professor Michael Taylor
Dr Wen Long Yue
Project title: Developing Neural Network Approach as a Robust Trip Distribution Modelling tool

Improving the generalization ability of Neural Network approach as a trip distribution modelling tool

Abstract:

Previous studies have suggested that the Artificial Neural Network (NN) models were unable to calibrate work trip numbers with the same level accuracy as the Double-Constrained Gravity models (DCGM). These NN models had a higher level of error and were unable to satisfy the Production and Attraction constraints. This study presents some new NN model forms aimed at overcoming these problems. It developed a numbers of NN models and trained them by using a different training algorithm, in this case the Lavemberg-Marquardt algorithm. The new results suggest that NN approach can satisfy both Production and Attraction constraints. The key factor behind these promising findings is the Newton search for minimum method of multivariable functions embedded in the training algorithm. However, the NN still had a higher error than the DCGM at the testing/generalization level. A further modification was then applied to the model, namely transforming the input data nonlinearly by using a logistic function. This resulted in better performance of NN models, where the average error (RMSE) is statistically the same as the DCGM.

Notes:



Name: Wella Hewage Chathurika Subhashini
Degree: PhD Civil Engineering
Supervisors: Dr Guna Hewa Alankarage
Mr David Pezzaniti
Project title: Methodologies to assess the performance of Water Sensitive Urban Design (WSUD) measures in maintaining natural status of flow regimes of urbanised catchments

Challenges in calibrating Storm Water Management Model (SWMM) to a rural catchment

Abstract:

Although SWMM is an urban runoff model, its application in rural catchments is widely acceptable due to the flexibility of the model. SWMM is frequently used in rural catchment for understanding future urbanisation scenarios/impacts and for investigating the effectiveness of WSUD or BMP measures. This paper discusses the complexity and the issues encountered when modelling hydrologic response of a rural catchment using SWMM and how these issues are confronted for making reliable model predictions. The challenges confronted include, modelling baseflow and interflow using simple Groundwater module of SWMM, obtaining aquifer/groundwater parameters and choosing the appropriate parameters and parameter ranges for model calibration. Scott Creek catchment in Mount Lofty ranges in South Australia was chosen as the study site to demonstrate how PEST (Parameter ESTimation) automatic calibration is incorporated into SWMM and how the above issues are confronted.

Notes:



Name: Zainul Baharuddin

Degree: PhD Planning

Supervisors: Dr Alpana Sivam
Dr Sadasivam Karuppannan
Professor Chris Daniels

Project title: Study on Urban Green space and wildlife in Kuala Lumpur

Urban green space: perception and wildlife abundance in Kuala Lumpur

Abstract:

Urban green space plays an important role in enhancing the quality of environment and provides important space for urban wildlife. While many urban dwellers indicate they are concerned about wildlife conservation, they often have little knowledge about conservation of local wildlife. The aim of this presentation is to demonstrate citizens' and stakeholders' understanding of their responsibility for urban wildlife and relate this information to the abundance of urban wildlife in urban green space in Kuala Lumpur. Preliminary findings of this research on urban wildlife have been drawn from interviews with visitors to urban parks and representatives of the National Landscape Department (JLN) and City Hall of Kuala Lumpur (CHKL), and from a survey of urban wildlife species and the quality of their habitats. Many respondents expressed serious concerns of conservation and preservation of urban biodiversity for future generations. Most of respondents acknowledge the important role of biodiversity in urban development. However, significant number respondents did not have a clear idea about their interaction with urban wildlife. The observation survey highlighted that common urban birds dominate in urban green spaces regardless the size of the green spaces. However, only larger urban green spaces help protect species. Urban wildlife in Kuala Lumpur is rapidly declining and there is a great need for the community and stakeholders to promote programs and activities to preserve and enhance urban wildlife, addressing issues such as awareness, interaction, education, management of green space, wildlife protection and effective participation and support from communities, NGOs and other stakeholders.

Notes:



Name: Ivan Iankov
Degree: PhD Transport Systems Engineering
Supervisors: Professor Michael Taylor
Dr Rocco Zito
Project title: Modelling road transport greenhouse emissions in carbon constrained Australian economy

Impact of carbon efficient cars on Australian road transport emissions until 2020 and 2030

Abstract:

Two important issues surrounding projections of total road transport greenhouse gas emissions are rebound effect and the potential of vehicle technologies to reduce emissions. The rebound effect is the anticipated increase in vehicle use as a consequence of the decrease in vehicle running costs, mainly associated with cheaper production of energy. It is important to note that vehicle running cost and vehicle-kilometres-travelled are related in a non-linear way. The magnitude of change in vehicle-kilometres-travelled depends on the level of existing transport activities. Recent studies analysing the future trends of Australian road passenger transport suggest a decrease in the growth rate. Similar trends have been reported for other developed countries. The analysis of vehicle technologies for reduction of greenhouse emissions (considering both effectiveness and cost) aims to identify the potentials for reduction of greenhouse emissions at acceptable costs. The results of the analysis support the hypothesis that considerable reduction of new vehicles' greenhouse rates is possible at low to medium cost. Yet these results do not guarantee the implementation of technologies in a free vehicle market. A carbon price could be a mechanism to change buyers' preferences and manufacturers' willingness towards buying and producing carbon efficient cars. However the required carbon price for this change is well above the projected range. Experience shows that direct government subsidies successfully influence new vehicle market. In conclusion, improved vehicle carbon efficiency has the potential to reduce Australian road transport greenhouse emissions. However, it is unlikely that these potentials will become reality without direct government subsidies to manufacturers and (compulsory) standards for carbon efficiency.

Notes:

Research Students Unable to Present



Name: Mary-Anne Binnie

Degree: PhD Geology

Supervisors: Professor John Cann
Assoc. Professor Jim Jago

Project title: Application of benthic foraminifera to infer Holocene sea-level changes in northern Spencer Gulf, South Australia.

A record of Holocene benthic foraminifera in vibrocore SG#279, Spencer Gulf, South Australia

Abstract:

Core SG#279 recovered 1.1 m of Holocene bioclastic sediment from northern Spencer Gulf, South Australia. Benthic foraminifera preserved in these sediments provide proxies for the postglacial marine transgression. Species that are characteristic of tidal dominated, coastal seagrass meadows, *Cribrobulimina mixta* + *Nubecularia lucifuga* + *Peneroplis planatus* + *Discorbis dimidiatus* decrease in numbers upcore confirming their potential to signify a rising sea. *Massilina milletti*, which favours the deeper waters of northern Spencer Gulf, increases in abundance upcore, thus also signifying the transgression. *Quinqueloculina lamarckiana*, which positively correlates with increasing water depth in northeastern Gulf St Vincent, similarly provides evidence of the transgression. Maximum water depth is indicated for the core sediments at 40 cm. Data based on the distributions and relative numbers of *Elphidium crispum* and *Elphidium macelliforme* were not in accord with those of the other proxy species. It is concluded that the *Elphidium* ratio is unreliable when applied to sediments deposited at depths of <15 m. Above 40 cm in the core, the distribution of *M. milletti* provides evidence of marine regression that has been attributed to hydroisostatic uplift of northern Spencer Gulf. The foraminifera provide no credible evidence of any late Holocene sea level rise (Binnie, M. N. & Cann, J. H., 2010 in press).

Notes:



Name: Michael Heath
Degree: PhD Environmental Management
Supervisors: Dr Sophie Petit
Ms Joan Gibbs
Project title: Direct seed mix and tubestocking treatments for restoration of degraded agricultural land, Pt. Wakefield, South Australia

Response of macro-invertebrate species and communities to low and high diversity seed-mix treatments for the restoration of vacant agricultural land, Pt. Wakefield, South Australia

Abstract:

It is important that land managers have accurate knowledge of how direct seeding should be best used in the restoration of vacant agricultural land, as treatment requires large amounts of native seeds which are in limited supply. As part of my thesis I am comparing the response of invertebrate communities to the sowing of a low diversity seed mix and a high diversity seed mix for restoring an agriculturally degraded semi-arid site. Invertebrates have an important role in ecosystem function, such as nutrient cycling, plant growth and reproduction, and the establishment of the food chain, and therefore provide valuable information on ecological change associated with land use (Andersen & Sparling 1997; Majer & Nichols 1998; Andersen et al. 2002). With this in mind, I will use invertebrates as bio-indicators to determine whether the low and high diversity treatments are adequate for restoring the agricultural sites by comparing the results from these treatments to neighbouring remnant ecosystems and previous revegetation attempts. The invertebrate communities are to be compared in terms of abundance, species richness and species diversity. As recovery progresses the difference between the invertebrate community indices should lessen (Majer & Nichols 1998).

Notes:



Name: Alaa Gabr

Degree: PhD Civil Engineering

Supervisor: Dr Don Cameron

Project title: Repeated Load Testing for Primary Evaluation of Recycled Concrete Aggregate in Pavements

The specification of recycled concrete aggregate for pavement construction

Abstract:

Large volumes of aggregate are being produced in response to Society's demand for a greener environment, less landfill and preservation of natural resources. Unfortunately the take up of Recycled Concrete Aggregate (RCA) by the construction industry has not been as impressive as the production by the recycling industry. This paper reviews existing specifications within Australia and internationally, specifically for the application of RCA as pavement material for unbound sub-bases and base-courses. Commonality of specifications is explored and differences that exist are questioned. Ultimately a national standard should be achievable which should encourage the use of RCA. In this paper, two Adelaide-based RCA products, which were designed for use as pavement bases, are compared with current engineering specifications.

Notes:



Name: Jamal Abdusalam
Degree: PhD Project Management
Supervisors: Assoc. Professor George Zillante
Dr Nicholas Chileshe
Project title: Developing the Higher Education System in Libya
by Implementing Total Quality Management

Developing the higher education system in Libya by implementing Total Quality Management

Abstract:

The main focus of this study is the assessment of Total Quality Management (TQM) and its potential for the Libyan higher education. TQM strategies are often associated with business and industrial organizations; however the study will evaluate the application of TQM methods for education. Research in TQM application in Higher education has not received much attention in Libya hence this study is of great importance to Libya as far as higher education is concerned. Question that arise in the study, Will TQM strategies improve the higher education system in Libya? Therefore the study intends examine the extent to which TQM is applicable to the Higher education system in Libya. With regard to this purpose the objectives that will guide the study are; to define total quality management and explore its development and underlying philosophy through a review of literature, To investigate the tools and techniques necessary for the evaluation of TQM in higher education, To establish the barriers inhibiting the implementation of TQM, To identify the critical success factors that lead to the effective implementation of TQM and finally to develop a TQM framework for Libyan higher education. To be able to realize the aim and objectives of this research, the study will use a triangulation approach which includes both quantitative and qualitative approach. For data collection interviews will be conducted and questionnaires issued to the target population with the intent of capturing their perceptions concerning the situation of higher education systems in the country and the efficacy of TQM implementation within them.

Notes:



Name: Wei Zhang
Degree: PhD Civil Engineering
Supervisor: Assoc. Professor Linda Zou
Project title: Nanocomposites of porous materials and photocatalysts for efficient wastewater purification

A parametric study of visible-light sensitive TiO₂ photocatalysts synthesis via a facile sol-gel N-doping method

Abstract:

In present work, optimisation of visible-light sensitive TiO₂ via a facile sol-gel N-doping method was carried out. Visible-light activity of as-prepared products was studied using solutions of methylene blue (MB) as a model pollutant. Optimal visible light activity was achieved at equal N-to-Ti precursor molar ratio and 350°C calcinations. In the end, characterization of structural, chemical and optical properties of optimally synthesized TiO₂ photocatalysts was also undertaken. The pH value of N-doped TiO₂ sol during the preparation was found to be an effective indicator of N-doping quality without using any post-synthesis analysis. These findings could be utilized in the successful development of TiO₂ photocatalysts or its nanocomposites for cost effective solar-driven environmental technology.

Notes:



Name: Helen Waudby

Degree: PhD Environmental Management

Supervisor: Dr Sophie “Topa” Petit

Project title: The role of cracking clay soils in maintaining rangeland biodiversity in South Australia: implications for sustainable management of arid-zone landscapes

Use of cracking clay habitats by small terrestrial vertebrates in the South Australian arid zone

Abstract:

My research is focussed on examining the role of cracking clay soils in supporting arid-zone biodiversity and the effect of cattle grazing on these ecosystems. Shelters can be scarce in arid environments and these cracks may represent valuable habitat for small native mammals and reptiles. Consequently, one aim of this research is to determine how small terrestrial vertebrates use cracks. I am in the process of elucidating habitat use in cracking clay areas through the radio tracking of small mammals and reptiles. Radio transmitters (Holohil Systems Ltd., Ontario, Canada) weighing 0.35 g are attached to vertebrates with veterinary adhesive. Since radio transmitters should not exceed 5% of an animal’s total mass, only individuals with a mass of more than 7 g are fitted with transmitters. Individuals are followed and their shelter locations recorded. A number of shelter measurements are recorded. To date, I have radio tracked several species, including fat-tailed dunnarts (*Sminthopsis crassicaudata*), stripe-faced dunnarts (*S. macroura*), and gibber dragons (*Ctenophorus gibba*). All three species regularly use crack shelters. Further radio tracking is being undertaken. It is expected that this research will improve our understanding of the ecology of small desert vertebrates and the value of cracking clay habitats.

Notes:



Name: Jantanee Dumrak
Degree: PhD Project Management
Supervisors: Dr Sam Baroudi
Dr Stephen Pullen
Project title: Evaluating collaborative reproductive health programs in Thailand

Evaluating collaborative reproductive health programs in Thailand

Abstract:

This research aims to investigate the sustainable outcomes of collaborative reproductive health programs in Thailand by conducting research in that country. Reproductive health issues are not a new concern for Thailand alongside of other developing countries in Southeast Asia. For decades the Thai Government has devoted a great amount of resources to reducing poor reproductive health statistics. A key partner helping Thailand with this problem is The United Nations Population Fund or UNFPA. This is an international development agency. Historically most UNFPA Country Programmes undertaken in Thailand have been funded for an average of 5 years. The program funding generally ceases at the end of the nominated period. It is thought difficult to maintain long-term benefits when these programs contain a mandatory expiry date. This is further compounded when reproductive health issues are related to behavioural and cultural change and are therefore recurrent. It is believed closing out reproductive health projects without achieving sustainable outcomes impacts on the sexual and reproductive lives of Thai people. This study hopes to improve this situation by applying project management knowledge. The study will be via surveys on specific reproductive health projects that will build into case studies. The results will then be analysed with the application of project management knowledge. Issues related to these reproductive health programs involving their operation and outcomes will be examined. The ability of project management knowledge and its concepts to create sustainable outcomes will then come under the lens.

Notes:



Name: Wun Kwong Ng

Degree: PhD Project Management

Supervisors: Assoc. Professor George Zillante
Dr Jian Zuo

Project title: The future of Project Procurement (PP) used in the Hong Kong consumer electronics industry

Selection of project procurement methods in the Hong Kong consumer electronics industry - a Delphi study

Abstract:

Project procurement (PP) method is to define how the design, development and manufacturing are acquired. Selection of an appropriate PP method is crucial to achieve the project success. The consumer electronics industry is no exception. Under the pressure from the ever increasing level of market competition and the global financial crisis, clients are desperately to understand the way to choose the most appropriate procurement method and hence to improve their competitiveness in the consumer electronics industry. Four rounds of Delphi survey were conducted with 12 experts in order to identify the common criteria and the most appropriate PP method in the Hong Kong consumer electronics (CE) industry. This study revealed that the most important criteria for PP selection are product quality, capability, price competition, flexibility and speed. These research findings are useful for clients to select the procurement strategies.

Notes:



Name: Zeeshan Aslam
Degree: PhD Civil Engineering
Supervisors: Assoc. Professor Christopher Chow
Professor Simon Beecham
Project title: Novel treatment processes and modelling of surface water resources for potable supply impacted by climate changes

Novel treatment processes and modelling of surface water resources for potable supply impacted by climate changes

Abstract:

The research detailed in this proposal aims to optimized conventional and novel treatment processes for South Australia waters in response to source water quality changes arising from the effects of climate change. These climate changes effects may cause increased salinity, colour changes, lower turbidity, and variations in concentration of dissolved organic carbon (DOC) depending on season and location and higher incidents of algae and blue-green algae in drinking water sources. This study will investigate the trends in source water quality, develop novel and optimize conventional treatment of these source waters. Waters will be investigated using projected water quality changes in South Australia over recent times and longer periods especially of the Murray Darling Basin's water. The potential of modelling for the prediction of optimum coagulant (type, dose, and combinations of coagulants) for the removal of dissolved organics, turbidity, colour and maximizing treated water quality will be investigated in relation to seasonal variations. The modelling will be mathematically based by generation of algorithms, as opposed to data driven modelling and it will be conducted to describe the mechanisms of the processes. Semi empirical and empirical models will be investigated for potential appropriate and suitable application at water treatment plants in South Australia.

Notes:

Name:	Diana Mohamad
Degree:	PhD Planning
Supervisors:	Dr Matthew Rofe Professor Michael Taylor
Project title:	E-education : the potential of telecommuting in the higher education institutions in Malaysia

E-education : the potential of telecommuting in the higher education institutions in Malaysia

Abstract:

Telecommuting work arrangements may help improve problems inherent in transportation, such as traffic congestion, travel cost, accessibility, transportation modes and transportation modes share. A number of studies have used various methods to research telecommuting work arrangements, including research on environment, transportation, health, spatial management, demand and supply of the technology, key features of arrangement(s) implementation and comparison between arrangements. My research is utilising multiple methods to look at these issues and I will compare my results to previous work. I will use a two-stage approach incorporating a questionnaire survey and memory-jogger methods.

Notes:



Name: Aaron O'Malley
Degree: PhD Civil Engineering
Supervisors: Dr Don Cameron
Dr Kevin Mills
Ms Joan Gibbs
Project title: Soil Moisture Patterns and Ground Movements on Extremely Reactive Soils, in the Environment of South Australia

Site Classification and early floor movements in a new subdivision

Abstract:

A field site for the study of the influence of urban street trees and house footings on extremely reactive soil was established within a new subdivision, north east of Adelaide. Extensive site classification was performed. Initial soil suction profiles, shrink-swell indices and unconfined swell tests were determined, along with standard index tests and methylene blue absorption values. The house floor levels of four stiffened raft slabs have been monitored, with one raft slab having a heavily stiffened floor. The performance of the raft slabs to date based on regular level surveys of the floors is reviewed in terms of the site classification data. The influence of the developers in preparing the subdivision for the market is discussed.

Notes:



Name: Abdelhalim Azam
Degree: PhD Civil Engineering
Supervisor: Dr Don Cameron
Project title: Recycled Clay Masonry as a Pavement Construction Material

Recycled clay masonry as a pavement construction material

Abstract:

As the highways network moves from the construction phase to the phase of maintenance and rehabilitation, it is essential to consider recycling as one of the most promising solutions for rehabilitation of flexible pavements. Australian landfills receive about 14 million tonnes of waste every year, of which about 44% is a result of construction industry processes. Recycled materials such as recycled concrete aggregate (RCA) and crushed clay masonry may be used as either bound or unbound pavement materials. The proportions by dry mass of crushed masonry will range between 10 and 50% of the total aggregate mass. The main objective of this research is to evaluate the applicability for basecourse pavement construction of combinations of recycled concrete aggregate and crushed masonry. The performance of recycled materials over typical ranges of moisture content and density, In particular, the resilient stiffness under cyclic loading and permanent strain accumulation. Repeated Load Triaxial Tests (RLTT) will be conducted on the unbound granular materials and cement bound materials at three stages of loading for permanent deformation measurement and 66 stress stages for resilient modulus characteristics according to the AUSTROADS method and the simpler DTEI (SA) approach. The shear strength and stiffness of the materials will be investigated also by static triaxial tests. A pavement testing facility will be constructed to measure deformations and stresses in the pavement materials under simulated traffic loading and finite element analyses of pavement behavior will be performed.

Notes:



Name: Jianqiang Cui
Degree: PhD Transport Systems Engineering
Supervisors: Dr Andrew Allan
Professor Michael Taylor
Project title: Pedestrians, space and city centers – towards an understanding of the influence of underground pedestrian on urban environments

The effect of influencing factors of urban environment on developing underground pedestrian systems

Abstract:

Dominant modes of transport in city centres have a significant influence on urban morphology, land usage, the character of the urban environment and people's life style. Cities are currently faced with potentially severe environmental impacts from global warming and other detrimental side effects resulting from a high dependence on motor vehicles, and many metropolises are now beginning to realize the importance of planning and developing walking as a primary travel mode in the city. Improving accessibility, continuity, safety, availability and connectivity for pedestrians has crucial significance as a means of decreasing vehicle usage and increasing public transport usage. In some places, underground pedestrian networks have been used to integrate pedestrian traffic in transport systems, contributing to walkable cities with convenient and harmonious pedestrian spaces. At the same time, they are used to provide additional space resources for multiple functions (such as commercial and public activities). My research will focus on the interrelationship between underground pedestrian systems and urban environment to address the effect mechanism of underground pedestrian systems. This research will include: data collection from 50 cases of underground pedestrian systems worldwide will enable a comparative analysis to generalize influences of environmental factors on the development of underground pedestrian systems in cities; a review of literature regarding planning and design of underground pedestrian systems on land use, the transportation system and urban design; and a field survey in Shanghai, China, including on-the-spot observations, questionnaires and interviews.

Notes:
