

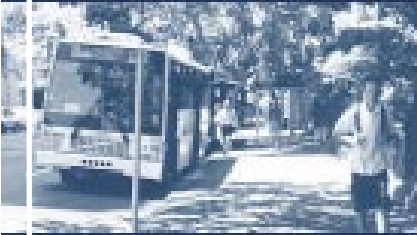


THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

CENTRE FOR TRANSPORT STRATEGY 2004 ANNUAL REPORT



QUEENSLAND TRANSPORT
MAIN ROADS
QUEENSLAND RAIL
UNIVERSITY OF
QUEENSLAND



2004 Highlights

- Successful research grant under the 2004 ARC Linkage Project program, led by Dr Holt-Damant (Architecture) for the transit oriented development project *Emerging futures: transit-oriented development as a strategy for dealing with urban sprawl and congestion in South East Queensland*, with a total project value of \$950K. ARC research grant of \$320K over three years commencing 2005, including two postgraduate research scholarships (one based in UQ CTS on institutional issues).
- Awarded a national research contract for *Improving Traffic Incident Management*, by Austroads (national road and traffic association) valued at \$90K over three years.
- Supervised a total of five postgraduate students – one part-time PhD student, three (3) part-time MPhil and one international full-time coursework (Grad Cert Eng) student.
- Supervised 4th year Civil Engineering undergraduate project; critic for 4th Year undergraduate Architecture student projects, assisted with graduate studio with UQ Architecture and Columbia University (New York) on Transit Oriented Development project. UQ won the Engineers Australia students prize for an undergraduate research project supervised by the Centre.
- Developed and conducted two joint UQ-QUT short courses in Brisbane: *Measuring Multi-modal Transport Systems Performance* (June 2004) and *Data Collection for Transport and Traffic Analysis* (Nov 2004); and arranged short course on *Planning & Evaluation of a Major Public Transport Facility* (Oct 2004) – over 100 participants from across Australia and New Zealand, including five graduate coursework students.
- Organised a series of international transport conferences: in Sydney – *Smart Traffic 2004: Taking a Business Approach to Roads* (May 2004); in Dubai – *SmartMove: Middle East Public Transport* (Oct 2004); and in Brisbane – *Smart Transport & Property 2004–Leveraging Transport Infrastructure for Property and Land Use Development* (Nov 2004).
- Facilitated debate of current and emerging transport trends with the Transport Futures project: published three editions of the journal (Dec 2003, Mar & Jun 2004) and held three industry seminars (23 Feb, 24 May & 30 Sep 2004).
- Ongoing liaison with transport industry including advisory committees, such as Queensland *Ministerial Transport Planning Advisory Group*, Queensland Transport Portfolio *Expert Advisory Panel*, Brisbane *Incident Management Coordination Committee*, Brisbane City *TransApex Project Executive Group* and *Accessible City Community Advisory Committee*, and professional associations, such as Engineers Australia *Queensland Division Transport Panel*.
- Advice to transport agencies on number of projects relating to transport strategy and institutional strengthening, including involvement in the following projects: *Strategic Process for Implementation of Integrated Regional Transport Plans* (QT), *corporate performance measures* (QR), *Scoping Study for Thailand Transport Sector* (QT).

Centre for Transport Strategy

The University of Queensland

The Centre was established at the University of Queensland in 1998 as a partnership between three state transport agencies (Queensland Transport, Main Roads and Queensland Rail) and three University Schools (Engineering; Economics; and Geography, Planning and Architecture) to undertake cross-disciplinary research and provide professional development and professional services.

An initial three year Memorandum of Understanding (MoU) (1998-2001) was extended for one year, and the current three year MoU concludes in June 2005.

The University provides undergraduate and postgraduate transportation engineering programs, undertakes leading research in transport strategy and advanced transportation technology and provides professional services and advice to industry.

The Centre's focus areas include transport policy and institutional development, integrated transport planning, intelligent transport systems, transport management and operations, passenger transport, transport economics, logistics and freight transport, travel demand management, sustainability of transport and stakeholder and community interaction.

Objectives

The aim is to be a centre of excellence in transport strategy and contribute to more integrated and sustainable transport by:

- undertaking, evaluating and promoting innovative, cross-disciplinary research and development in transport strategic planning
- developing and advancing opportunities for joint ventures in research and development, training and the provision of professional services in transport strategy and planning
- raising the profile of transport strategic planning among researchers, government and industry
- developing appropriately skilled professionals for the transport sector.

Activity Areas

The key activities of the Centre are to undertake **research**, provide **professional development**, collate transport related data, provide **professional services** and advice and develop methodologies and policies in transport strategy.

Centre Partners

Queensland Transport

Queensland Transport aims to make it safer, easier, environmentally-friendlier, and more cost effective to move people and goods across town, state and overseas. The department works closely with the community, industry and government agencies, to ensure a coordinated, consultative and integrated approach to addressing and resolving transport challenges.

< www.transport.qld.gov.au >

Queensland Main Roads

As owner and manager of the State's road network, Main Roads strategically plans and develops road infrastructure. Through identifying community needs, and setting departmental priorities and program objectives, they effectively manage a road network that contributes to the State's development and progress.

< www.mainroads.qld.gov.au >

Queensland Rail

Queensland Rail (QR) is a government owned corporation and one of Australia's largest and most innovative transport operators. On any weekday, the QR network operates 900 train services, transports more than 400,000 tonnes of freight and safely carries around 160,000 people.

< www.qr.com.au >

The University of Queensland

– School of Engineering

Research activities cover the range of engineering and include the field of transportation engineering, with research projects covering traffic management, advanced transport technologies, intelligent transport systems and travel demand management. Undergraduate and postgraduate education specialties in transport engineering are also provided. < www.eng.uq.edu.au >

– School of Economics

Specialising in microeconomic policy, public enterprise economics, transport economics. Research interests: Australian transport policy; government regulation of industry; cost-recovery in the transport sector; economic effects of cross-subsidisation policies of public authorities.

< www.uq.edu.au/economics >

– Geography, Planning & Architecture

Combines the disciplines of geography and geographic information science with urban and regional planning and development and architecture and urban design. offers study leading to career opportunities in the fields of geographic information science, urban and regional analysis, planning and development and environmental processes and management and architecture.

< www.gpa.uq.edu.au >

Memorandum of Understanding

The current Memorandum of Understanding (MoU) operates for three years concluding June 2005, and outlines the cooperative relationship between the industry partners, Queensland Transport, Main Roads, Queensland Rail, and the University of Queensland to achieve mutual benefit through a joint approach in transport through research, education, training and service delivery, and any commercial opportunities that may accrue.

Objectives

The high level objectives of this arrangement between the agencies and the university in relation to the MoU are to:

1. Develop a cooperative working relationship between the parties.
2. Enhance the capabilities of each organisation to achieve their goals by sharing expertise, knowledge and resources.
3. Develop appropriately skilled professionals for the transport sector and facilitate a critical mass of education and research expertise.
4. Progress interdisciplinary research and development in transport, education and training, opportunities for joint ventures in research and development, and the provision of professional services.
5. Promote these arrangements within the partner institutions and in the community to facilitate informed debate on transport issues and solutions.

Strategic Management Committee

The Strategic Management Committee was established under the MoU to:

- provide strategic direction for the work of the Centre;
- approve an annual set of goals;
- approve an annual work program of activities;
- determine funding arrangements by the partners to the MoU; and
- review the benefits, execution and outcomes of the approved program.

The membership of the Committee comprises:

- Director-General, Queensland Transport
- Director-General, Main Roads
- Chief Executive, Queensland Rail
- Executive Dean, Faculty of Engineering, Physical Sciences and Architecture, UQ (Chair)
- General Manager (Road System & Engineering), Main Roads
- Executive Director (Integrated Transport Planning), Queensland Transport
- Chief Strategy Officer, Queensland Rail
- Head, School of Engineering, UQ

Other representatives are invited as observers to the Strategic Management Committee, including the Director of the Centre for Transport Strategy, representatives from the other relevant schools at UQ and the transport agency program managers.

Portfolio University Group

The transport Portfolio University Group (PUG) was established to:

- overview transport research and development activities across the universities;
- prepare a draft annual program and budget in accordance with broad objectives outlined by the Strategic Management Committee, including quantitative and/or milestone objectives for approval by the Strategic Management Committee;
- monitor and review progress against the annual program; and
- facilitate collaboration between agencies and universities and seek research funding leverage through Australian Research Council grants.

The Portfolio University Group is chaired by:

- Executive Director (Integrated Transport Planning), Queensland Transport; and
- General Manager (Road System Engineering), Main Roads.

Membership of the Group comprises representatives from all the partners in the Centre. A similar agreement exists between Queensland University of Technology (QUT) and transport portfolio agencies. The Portfolio University Group facilitates both arrangements.

A primary role of PUG has been to develop and update the *Strategy for Cooperative Research & Professional Development*, coordinate activities between UQ and QUT and oversight the development of the forward program for both universities.

Director, Centre for Transport Strategy

Prof Phil Charles

BE (NSW), BBus (Public Admin)(RCAE), MEngSc (NSW), GDM (Public) (UTS), GDM (Business) (NSW), FIEAust MASCE MITE CPEng

Professor of Transport Strategy and Director, Centre for Transport Strategy

Key research areas and expertise

- Transport strategy and policy development, including regional strategic planning and implementation and transit oriented development
- Transport systems operations, including intelligent transport systems, traffic and incident management, transport operations, travel demand management, freight and logistics, passenger transport and sustainable transport
- Strategic analysis, futures scanning and scenario planning, strategy and business planning
- Institutional development and strengthening, including policy development, organisational restructuring, implementation planning and monitoring, public private partnerships, institutional issues and professional capability development.

Research Program

The transportation research strategy places a high priority on the relevance of research to industry and government needs. The *Strategy for Cooperative Research & Professional Development*, which is subject to ongoing development in consultation with the transport industry, involves:

- developing industry oriented approaches – tailoring best practice approaches to integrated transport, public transport, traffic, intelligent transport systems, logistics and freight planning and management; and sustainable transport issues relating to economic, social, safety and environmental impacts
- progressing modelling and evaluation methodologies; test conceptual frameworks and demonstrate feasibility of approaches and set up a transport modelling and transport simulation laboratory and research capability in cooperation with industry partners and other higher education institutions
- develop strategic alliances with other higher education institutions and transport research centres and maximising access to resources including leveraging funding through research grant schemes

Strategic Themes

The *Strategy* has been developed to define the strategic themes for research being undertaken by universities associated with Queensland transport agencies.

The purpose of this strategy is to provide direction for research and professional development activities of the UQ Centre and the Chair in Transport QUT under the MoU arrangements, for the purposes of developing research proposals, including funding proposals under grant schemes, and postgraduate study and preparing professional development programs and short courses.

It provides for a focused effort on four broad priority areas:

1. **System Performance** – evaluation frameworks, data & information
2. **Freight and Logistics** – heavy vehicles & asset management
3. **Mobility Management** – public transport, demand management & land use
4. **Transport Operations** – traffic & incident management & ITS

Research Priorities

System Performance – evaluation frameworks, data & information – to develop sound and transparent economic, social and environmental evaluation frameworks to facilitate multi-modal investment decisions regarding transport infrastructure and management of system performance.

- economic justification modelling for transport infrastructure – model specifications and functionality, ownership and management, accessibility, freight/passenger interaction
- best practice review of multi-modal evaluation framework models & transit evaluation methodologies
- system efficiency versus operator efficiency driven transport planning
- infrastructure funding models – potential models for funding the development of transport infrastructure
- appropriate performance indicators for evaluation purposes
- transport system case studies – review of specific project case studies – economic and commercial imperatives, policy impacts etc
- cross-institutional issues associated with transport – eg role of various institutions and implications of purchaser-provider framework
- urban transport organisation and institutional issues

- integrated public transport – effectiveness and impacts of modal integration in Australian cities from various perspectives – customer, purchaser, provider, political etc

Freight and Logistics – heavy vehicles & asset management – to undertake research focussed on improving the efficiency of the freight and logistics sectors, whilst minimising the potentially detrimental impacts on the environment.

- identify the most appropriate and effective roles of governments at all levels, in the management of supply chains
- develop an appropriate evaluation framework for the evaluation of freight modal alternatives, using specific case-studies.
- identify the role of its in the improvement of freight and logistics activities and in the management of supply chains
- identify how e-business and e-commerce can/should be integrated with its initiatives for better supply chains
- identify and quantify the major determinants of freight modal choice
- quantify the effects of more freight efficient vehicles on modal shares; asset damage; environmental and urban amenity impacts

Mobility Management – public transport, demand management & land use – the changing nature of travel and the changing transport now and into the future, both passenger and freight transport. To progressively identify and develop transport trends, data & information and models to facilitate improved land use and transport planning.

- reviewing current global transport planning and policy trends
- progressing transport futures scenario planning work undertaken in Queensland
- transport and the environment – modal shift analysis, greenhouse gas mitigation initiatives, noise mitigation, role of ITS
- freight movements in urban areas – economic evaluation on the restrictions on freight movements, priority lanes for road freight, etc.
- travel survey methodology, transport data requirements and analysis techniques
- integrated transport planning skills for local authorities

Transport Operations – traffic & incident management & intelligent transport systems – to explore initiatives for cost-effective improvements to the capacity and productivity of existing transport infrastructure. To assist in better management of existing infrastructure.

- identify/evaluate potential initiatives aimed at improving the transport system infrastructure capacity, through inter-modal initiatives, use of technology etc
- infrastructure capacity management – role of individual modes, capacity modelling parameters of fixed infrastructure, inter-modal initiatives, travel demand management, role of ITS in managing and improving capacity
- develop appropriate ITS evaluation methodologies with the use of case-studies. Quantify costs and benefits attributable to ITS system components
- review asset management practices and identify Portfolio R&D projects with high rates of return
- the port-rail interface – improving the efficiency and effectiveness of the interface.

Research Higher Degree Students – Centre for Transport Strategy

- Sustainable transport: Frederik Preisler (Part Time PhD student) Topic: *Analytical Techniques to Incorporate Sustainability in Transport Projects* (joint supervisor with School of Economics)
- Integrated public transport: Mark Streeting (Part Time MPhil student) Topic: *Desirable fares and ticketing policy reform in a contactless smartcard environment*
- Travel demand management: Sean Weier (Part Time MPhil student) Topic: *Travel Demand Management: integrated and collaborative institutional model and principles*
- Demand responsive transport: Paul Logan (Part Time MPhil student) Topic: *Best Practice Delivery of Demand Responsive Transport in Queensland Regional Cities*

– School of Engineering

- Mr Suphasawas Nigarnjanagool (Full Time PhD student) Topic: *Development and Evaluation of Agent-Based Adaptive Traffic Signal Control System* (supervisor Dr Dia)
- Mr Sakda Panwai (PhD Full Time) Topic: *Modelling Driver Behaviour Using Intelligent Agents* (supervisor Dr Dia)
- Noppakun Boongrapue (PhD full time) Topic: *Integrated traffic responsive real time transport systems for urban traffic network* (supervisor Dr Dia)
- Sarintorn Winyoopadit (PhD full time) topic to be determined (supervisor Dr Dia)
- William Gondwe (MPhil part time) Topic: *Network Performance evaluation of integrated automated incident detection systems* (supervisor Dr Dia)
- Caroline Sutandi (PhD part time) Topic: *Evaluation of Adaptive Traffic Management Systems in Developing Countries* (supervisor Dr Dia)
- Kim Thomas (MPhil part time) Topic: *Incident detection on arterials using neural network data fusion of simulated probe vehicle and loop detector data* (supervisor Dr Dia) (thesis submitted)

Undergraduate Research – Centre for Transport Strategy

- UQ 4th year undergraduate student Shaun Kan Keen Yang won IEAust annual student prize for 2004 with presentation on his thesis topic: *Intelligent Transport Systems Technologies and Systems Requirements Needed to Respond to Security Incidents for South East Queensland*
- Transport evaluation methodologies: Patrizia Susanto and Brett Connell (4th Year Civil) Topic: *Develop a practice note for transport professionals and an annotated bibliography on road transport evaluation methodologies (benefit-cost, multi-criteria analysis etc)*. Presentation at IE Aust Transport Panel student evening.

Research Projects – Centre for Transport Strategy

Transit Oriented Development (TOD)

Collaborate with UQ Architecture project led by Dr Kathi Holt-Damant to raise awareness of practical principles to encourage transit oriented development. Activities included graduate student exchange with Columbia University New York and undergraduate projects in Architecture at UQ. Awarded Australian Research Council (ARC) Linkage Project research grant on transit oriented development, comprising: architectural and urban environment of TOD (UQ architecture); Global trends in urban sprawl and TOD (Columbia); threat management and counter-terrorism in the urban and architectural environment (Rand Corp) & institutional issues and success factors (UQ CTS). Queensland Transport and Queensland Rail are industry partners. Total value of this project is \$950K and ARC research grant of \$320K over three years commencing 2005, including two postgraduate research scholarships (one based in UQ CTS on institutional issues).

Traffic Incident Management (TIM)

Awarded *Improving Traffic Incident Management* project by Austroads over three years (2004-07), commencing July 2004, based on an extension of the UQ research project [value \$92K]. Project involves a best practice review of traffic incident management, assessment of current practices across Australia and New Zealand, development of an evaluation framework, overview of micro-simulation models, seminars and short courses and development of a best practice report.

Professional Development

UQ offers core and elective Transport Engineering courses in the undergraduate civil engineering program. Students may also complete a double major in Civil Engineering together with Transport, by taking all the transport elective subjects available.

Undergraduate Education

- Traffic Flow Theory and Analysis
- Transport Systems Engineering
- Traffic Systems Operations and Management
- Transport Systems Analysis
- Intelligent Transport Systems

Project and research thesis subjects can also be taken on a transport related project.

Postgraduate Education

- Graduate certificate in Engineering: Sean Kan (full-time coursework)

Other professional development activities

The Centre was involved with running three short courses in Brisbane during 2004:

- *Measuring Multi-modal Transport Systems Performance* (June 2004)
- *Data Collection for Transport and Traffic Analysis* (Nov 2004)
- *Planning & Evaluation of a Major Public Transport Facility* (Oct 2004)

Information Transfer

selected publications

- Sayeg, P and Charles, P (2004) *Submission by Queensland Rail on Caboolture to Landsborough Rail Upgrade Study*, internal report, January 2004
- Sayeg, P and Charles, P (2004) *Intelligent Transport Systems in Asia; market trends and prospects, Volume One: ITS in ASEAN & Volume Two: ITS in CHINA*, Transport Roundtable Australasia, Brisbane, March 2004
- Sayeg, P and Charles, P (2004) *Intelligent Transport Systems in Asia – Pacific; Summary of ITS Firms and Capabilities – ITS Profiles 2004*, Transport Roundtable Australasia, Brisbane, March 2004
- Charles P (2004) *Traffic Incident: Ipswich Motorway Goodna: Tuesday 18 May 2004, 5:50am – Review of Issues and Lessons*, report to Brisbane Incident Management Coordination Group (BIMCG)
- Charles P (2004) *Brisbane Incident Management Coordination Group (BIMCG): where next?*, review of the terms of reference and identified strategic priorities, discussion paper, May 2004
- Charles P (2004) *Are we ready? Land transport's role in national security*, Smart Urban Transport magazine, June 2004

- Charles P (2004) *Establishing Regional Incident Management In South East Queensland*, Road and Transport Research June 2004
- Charles P and Sayeg P (2004) *Scoping Study for Thailand Transport Sector*, Working Paper: One Ticket - integrated ticketing & institutional arrangements for Bangkok, report to Queensland Transport, December 2004
- Charles P and Sayeg P (2004) *Scoping Study for Thailand Transport Sector*, Working Paper: Facilitation of the Queensland Transport Industry - involvement in potential commercial opportunities to undertake transport projects in Bangkok Thailand, report to Queensland Transport, December 2004
- Charles P and Sayeg P (2004) *Scoping Study for Thailand Transport Sector*, Working Paper: Thailand-Queensland Mutual Cooperation - options for longer-term capacity building between relevant agencies, report to Queensland Transport, December 2004
- Charles P, Sayeg P, Gyte B and Symons P (2004) *Scoping Study for Thailand Transport Sector*, Working Paper: Bus Rapid Transit in Bangkok - Priority corridor to complement rail mass transit, report to Queensland Transport, December 2004

selected presentations

- *Transport Planning in SEQ*, presentation at UQ to visiting Columbia University masters students on transit oriented development project, 4 February 2004
- *Centre for Transport Strategy*, at Queensland Transport Senior Management Forum held on 6 February 2004
- *Traffic Incident Management* presentation at multi-agency desk top training session held on 18 June 2004
- Presentation titled *Brisbane's Roads: heading in the right direction? Technology Solutions* at ARF function held in Brisbane 28 September 2004
- Presentation titled *Options for managing road transport demand*, at Transport Futures Seminar on 30 Sep 2004
- Presentation on *Applying Traffic Incident Management Strategies for Transport Security at the Road and Rail; Security 2004* held in Sydney 24 October 2004
- Presentation at *Smart Transport and Property 2004* held in Brisbane 4-5 November 2004 titled *Institutional and coordination issues – importance of the right framework: effective regional transport implementation*
- Presented sessions at the *Intelligent Transport Systems: Overview and Applications* short course held in Bangkok 18 November 2004

attendance at conferences

- Attended *Australian Roads Summit 2004* conference, held in Sydney 24-25 February 2004
- Organised *Smart Traffic 2004* conference held in Sydney 4-5 May 2004 and *Smart Transport and Property 2004* (also presented and chaired sessions), held in Brisbane 4-5 November 2004
- Organised program for, chaired day one and presented paper at *SmartMove* conference held in Dubai 12-14 October 2004

Activities and Services

- Member of Queensland Transport Portfolio *Expert Advisory Panel* providing independent advice on the development and assessment of innovative transport policy options for SEQ
- Committee Member – International *Consortium for ITS Training and Education (CITE)* comprises more than 41 universities and industry partners and aims to provide ITS courses on the Internet.
- Committee Member – Institution of Engineers, Australia, *Queensland Division Transport Panel*
- Member – Queensland *Ministerial Transport Planning Advisory Group*
- Member – *Brisbane Incident Management Coordination Group* and *Brisbane Multi-agency Working Group*
- South East Transit Evaluation – Chair *Independent Expert Advisory Committee*
- Editor Smart Urban Transport magazine and electronic newsletter (to September 2004)
- Editor Intelligent Transport Systems Australia quarterly newsletter
- Facilitated session with Queensland Rail Senior Executive on developing corporate performance measures for QR
- Member, Brisbane *Accessible City Community Advisory Committee*
- Member, Board of UQ Faculty of Engineering, Physical Sciences & Architecture
- Member of the Brisbane City TransApex Transport Reference Group and pre-feasibility Project Executive Group. Developing strategic context and pre-feasibility report for the TransApex proposal, involving a series of major road and tunnel connections around the Brisbane CBD, being developed by Council's Major Infrastructure Projects Office.