

THE EVOLUTION OF ITS WORKSHOP

SUMMARY REPORT

2014

Network Reliability Policy Chapter

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The Roads Australia Network Reliability Policy Chapter was established in 2008 to provide a forum for government and industry to discuss the requirements of the transport system and the impact of reform, to improve network efficiency and productivity.

1. Background

In 2014, 160 national transport executives assembled in Brisbane for a Roads Australia Network Reliability Policy Chapter workshop on the Evolution of Intelligent Transport Systems (ITS).



The purpose of the Roads Australia Evolution of ITS workshop was to investigate the delivery of the customer experience using intelligent transport systems (ITS).

The agenda reviewed the:

- evolving data space
- changing transport data landscape
- growing ITS capability
- automotive/telematics industry perspective
- and the ongoing benefits of ITS for the transport system, today and into the future.

Hosted by the Queensland University of Technology (QUT), with support from Queensland Transport and Main Roads (QTMR), ITS Australia, GM Holden, Intelomatics, AECOM and Transfield Services, the workshop engaged participants to consider key ITS initiatives for the next 25 years and beyond.

Dennis Walsh, Deputy Chief Engineer, Road Operations, QTMR opened the workshop by describing the 'great opportunity' that exists for governments and industry to create integrated, timely, user-focused, accessible and reliable data flows to enhance the safety, efficiency and effectiveness of transport networks across Australia.

At the upcoming 2016 ITS World Congress, Australia will engage the world stage to demonstrate its world class capability in ITS in Melbourne. Roads Australia supports ITS Australia and industry, with a focus on freight, in preparing for this event.



2. Executive Summary

The Roads Australia Evolution of ITS policy workshop raised ideas and questions about ethics, community values and governing principles for the public and private sector to interact with the autonomous demand-driven transport system that will emerge in Australia within 25 years.

Participants agreed data should be shared. Some suggest access to it should be free. Participants suggested that an important policy objective to incorporate into a framework is to achieve a fully-integrated customer-driven transport network where travel demand (people and goods) meets the level of transport service received.

Participants identified the need to come up with the right value proposition to ensure community 'buy-in'.

Raising public awareness about transport system performance by:

- specifying the value travellers receive back from the network
- sharing system capacity and constraints
- setting baseline performance benchmarks; and
- reporting performance in real time, over time are ways participants suggested to quantify and communicate the benefits of an information-driven, outcomes-based transport system to users.

The introduction of trials is seen as a positive way to communicate the benefits of ITS to the public.

Participants recognised the importance of further investment in research and innovation to assist the Australian market to grow ITS capabilities and spawn new economic opportunities.

Key initiatives identified by participants to improve the quality of information for users, managers and investors included:

- developing open data accessibility and management protocols
- harmonisation of national cooperative-ITS standards and specifications
- creating an environment to adopt ITS innovation
- initial focus on vehicle to infrastructure; and
- become technology agnostic.

Government and industry share the vision to create an environment where smart infrastructure autonomously manages multimodal network demand. The challenge is to predict the behaviour of the next generation of mobility and interaction to design a response that adapts as social norms evolve.

Roads Australia continues to collaborate with public and private sector members to support ITS Australia, Austroads, researchers and other key government agencies to embrace the opportunities surrounding the adoption of ITS in Australia.

3. Key workshop themes

Below is a summary of key themes highlighted at the workshop:

i. Australia can extract more from existing infrastructure assets

- Productivity Commission suggests alternative measures to address congestion should be explored (e.g. advanced traffic management technologies)
- Recent innovations in digital technologies can increase productivity of traditional infrastructure
- Operations and maintenance is a strategic element that can optimise asset value to society
- Options and solutions to increase throughput optimisation, loss reduction, demand side measures and system-wide capacity balancing are a priority

ii. Fundamental shift from current mobility ecosystem (operationally and financially)

- Multiple connectivity technologies are emerging (ecosystem approach)
- Technologies will co-exist and complement, and in some cases, compete
- Trajectory toward full network awareness (converging technology and market forces)
- Data will service automated, context aware vehicles, increase network capacity and reliability and provide near zero accident rates
- 25% of new vehicles are sold with connected navigation platforms
- Beginning for aftermarket motoring club services, usage based insurances

iii. Digital age of infrastructure

- Transportation is a system of systems connecting modes, services, technologies and designs
- Queensland road network ITS asset is already worth over \$2billion and growing
- Today, agencies are using data in service delivery from a diversity of sources and data collection points, purchasing information, real time data collection and monitoring, decision support data, sharing data with users, data mining and visualisation capability
- Tomorrow, big data will feed the need for advanced data capture, management and analysis, with an emphasis on prediction (travel times, flooding, controls, autonomous systems)
- In 10 years (i.e. next model cycle) connected cars will access, consume, create and share information with people, infrastructure, machines and other cars

iv. Clear roles for both public and private sector

- Areas of market opportunity exist in: open data, modelling, simulation, visualisation, cycling data, crowdsourcing, probe vehicles, autonomous and connected vehicles
- Government shouldn't do what the private sector can do (e.g. data collection, installation, communication to users), but should retain residual role in safety and control functions

v. Connected vehicles will be here within 10 years, autonomous vehicles within 20 years

- Within 10 years cars will be able to talk to other cars
- Within 15 years cars will be able to talk to infrastructure
- Within 20 years autonomous vehicles will be able to operate full control at low speed

vi. Benefits of ITS are widely reported

- Global studies reveal significant reduction in crashes, travel time, fatalities and CO² emissions

vii. Cooperative ITS can only be cooperative if we all adopt common standards

- Australian automotive market size is 1.4% therefore need to participate in international efforts
- Diverging standards will lead to vehicles entering Australia with equipment that doesn't work or is disabled (channel allocation, message protocols)
- New cars will use the 5.9 GHz band from 2015
- To deliver, the automotive industry needs cheap hardware (low cost cameras, WiFi chips, radar and computer chips for vision recognition)

viii. Opportunity to accelerate infrastructure deployment to receive C-ITS benefits sooner

- Advanced ITS is both a tool for harvesting network related insights and for modifying behaviour in the interests of efficiency and safety
- Expect a major leap forward in road safety
- Infrastructure and drivers will know when/where emergency vehicle is heading
- Better planning of individual trips, therefore better utilisation of assets
- Better integration of multimodal transport
- Vehicles become sensors for high resolution information on road condition
- Many ideas to accelerate V2X deployment in Australia
 - a. traffic mobility lab
 - b. plug & play workshops
 - c. trial new algorithms (queue clearing, longer phases); and
 - d. run competitions on how to use big data

ix. Australia is a leader in ITS development and deployment

- Managed motorways – Australian first
- Multi-lane free flow electronic toll roads
- Parking management technology including in-ground sensors
- Intelligent speed assist
- Drive time traveller information systems
- Electric vehicle roll-out including battery switching
- Automotive innovation
- Smart air, port and bus services

x. Huge opportunity to showcase the best at ITS 2016 World Congress

- Challenges and opportunities of big open data
- Smart cities and new urban mobility
- Vehicle and network safety
- Automated vehicles
- Mobile applications
- Future freight
- Policy, standards and harmonisation
- Environmental sustainability

4. How can we shape the future of ITS in Australia?

Russell Whale, Executive Manager, Transport Infrastructure & Technology (ITS) at Transfield Services opened an interactive session with government and industry participants by discussing the agents of change in today's society, cultural mega trends and policy levers most likely to accelerate the evolution of the ITS market.

Participants were asked to answer 5 questions about important policy objectives, building the value proposition for community, key initiatives to improve delivery of customer information and strategies for improving the value of ITS in the business case for capital projects – considered across 3 time horizons of 5, 10 and 30 years.

Responses received from industry are detailed below:

1. A national framework on ITS has been developed by government and industry. Nominate 2 policy objectives that you see as important to be considered as part of this framework.

5 year time horizon

- Enable a customer-driven integrated transport system - by:
 - a. Adopting open standards
 - b. Harmonisation of systems
 - c. Optimising performance of existing assets
- Use rich data to optimise performance of signalised network.
Analytical tool to inform decisions (e.g. use of probe data)
- Real time information for better traveller decision making with data sharing
- Reassure users that intelligent transport systems are consistent with privacy principles.
(Should not be an inhibitor - privacy by design. Will influence user acceptance/take up)
- Harmonisation - standard KPIs and definitions

30 year time horizon

- Zero fatalities/serious injuries on networks
- Transport needs of the community met by totally integrated multimodal transport networks
- Productive, liveable and safe cities, despite projected growth
- Fully integrated smart, social and economic infrastructure
- The forever open road

2. How can we quantify the advantages of using ITS to improve the reliability of the transport network to the community?

5 year time horizon

- Communicate with the public, use public awareness campaigns
- Publish travel time variability between vehicles, day-to-day availability, move towards unified index, include cost of congestion
- Measure baseline performance (customer satisfaction, network performance indicator)
- Define consistency of reliability of journey time, ask users what they define as reliability
- Share experience of the system overtime e.g. ramp metering
- Use crowdsourcing data to measure baseline and interaction
- Individualise cost/benefit (financial, time, environment, social etc.)
- Use incident management, maintenance management, resilience and recovery performance – show better control and estimation
- Promote better use of current infrastructure, impact on infrastructure close to capacity
- Discuss variable speed limits to manage congestion, help public understand why
- Promote the benefits of the technological evolution e.g. in-vehicle technology, such as automated driving, human factors

10 year horizon

- Use social media and information the community feeds into social media
- Showcase quantity, consistency and accuracy of data
- Demonstrate benefits of increased utilisation of existing infrastructure
- Enable community to have the power of choice (route/time information)
- Standards - open and interoperable
- Compare predicted to actual travel time
- Use ITS reliability, accurate information (cross reference, travel time), availability
- Define reliability (use a metric), define KPIs (congestion times, establish a control), report benefits e.g. time realisation, cost benefit

30 year horizon

- Information driven (outcomes-based) travel decisions
- Human variability – policy becomes more important, data needs to improve policy
- Quantify outcomes
- Offer instant feedback
- Show how ITS drives network management
- Changed contractual arrangements – KPI driven
- Tally users – are they satisfied, patronage increasing, environmental benefits and cost
- Future skills that ITS offers society
- Show governance/organisational change is working to support better level of service

3. We have heard a lot about the emerging sources of data and capability in today's session. What do you see as the key initiatives that government and industry need to pursue to translate this into improved information for users, managers and investors?

5 year time horizon

- Open data, accessibility, management (Government)
- Standards (Industry)
- Vehicle to infrastructure (Government and industry)
- Technology agnostic (Government and industry)

10 year horizon

- Councils making data available
- Cheaper infrastructure, replaceable
- Pattern recognition e.g. Google epidemic
- Enabling access to data – streamlining commercial arrangements
- Joint agency and enterprise agree to provide their data in real time
- Standardising communications with agencies to share data
- Smart data, quicker detection
- Codes of practice

30 year horizon

- Data accessibility cost, collect, available, telematics industry
- Innovation – help industry overcome road blocks to innovation – agency and government to achieve in 5 years
- Worker types may differ in 30 years, transport business may completely different



4. What is your vision for ITS in Australia beyond 2030?

5 year time horizon

- Open data – available to everyone
- Users recognise ITS systems as a source of reliable data
- Users understand the benefits of ITS
- Data security
- Centralised policies
- Standardised data format
- Co-ordinated approach
- Endorsed strategy
- Integrated network and network optimisation – sharing of data – one network and interoperability of devices
- Commercial agreements in place to share data - it should not cost
- Full multimodal information system

10 year time horizon

Framework

- Established standards and architecture
- Privacy issues are resolved (people's rights are intact)
- Access to integrated data and visualisation of key information
- More efficient marketplace (red tape removal)
- Governance and management of public agencies in place

Culture

- Infrastructure matches the technical deployment
- ITS not seen as a nice to have, but a must have
- Integration of all the current system

Social

- Access to spare capacity (i.e. get a lift with someone with a spare seat close by)
- Insurance – no need for
- Safety – how do we increase the safety by all the applications
- Change driving a car as a 'want' rather than a 'need',
- Automate switch to other modes of transport (riding and public transport)
- Future skills required to maximise ITS benefits

Economics

- Road user charging
- Whole of life costs identified as part of project deployment
- Maximise technology deployment
- Minimise maintenance costs

30 year horizon

- ITS connects travellers for safe/productive/enjoyable community
- ITS is a system of systems, with integrated interfaces and open standards
- Good portion of vehicle fleet equipped with smarts
- Low road safety toll – more information available
- Focus on limit of the human to absorb information
- Able to prevent the preventable
- Smarter infrastructure can manage network user demands
- Support multi-modal use of network – giving the informer choice

5. What strategies do you think are needed to improve the efficiency and reliability of delivering ITS solutions within capital infrastructure projects? Will technology reduce or delay the need for capital infrastructure investment?

5 year horizon

- Develop a concept of operations (that will evolve over time) that includes ITS strategy
- Concept driven by operations and not design, need common platform for infrastructure
- Develop policy standards and guidelines, more education about ITS
- Enable innovation by opening the options
- Consensus is ITS delivers better management of infrastructure, may delay investment

10 year horizon

- Collaborative approach between government and providers
- National-based standards
- Open source framework (data open and easily accessible to everyone)
- Information to be free on the basis information is given
- Stored data needs to be summarised and stored centrally (raw data too big)
- Standard developed for appropriate method of summarising data
- Standards needs to be flexible

30 year horizon

- Government 'journey view' policy – holistic approach, break down barriers, more flexible funding models, policies need to be linked to target (cost benefit analysis)
- Ongoing investment in research, enabling technologies, interoperability (efficiency)
- Short increase in capital investment systems, support emergent technologies/skills
- Long decrease in capital investment systems, utilisation of network improvement
- Higher advocacy to public education to drive change
- Development of incentives for market to provide solutions
- Better knowledge sharing, enhanced communication/awareness/collaboration
- Standardisation (reduce duplication, and future proof system, keeping flexibility)
- Use/promote/elevate industry associations to guide/lead industry over longer term

5. Attendees

160 transport professionals from government and industry participated in the RA Evolution of ITS Workshop with QUT and TMR in Brisbane.

First name	Surname	Organisation	Title
Mark	Langdale	3M Australia	Senior Representative
Ian	McLean	A1 Highways	General Manager
Philip	Davies	AECOM	Director - Infrastructure Advisory, Asia Pacific
Albert	Kwong	AECOM	Principal Engineer
Daniel	Lovisa	AECOM	Associate Director
Shalendra	Ram	AECOM	Business Development Manager - Transportation
Allan	Krosch	Allan Krosch Consulting	Managing Director
Henry	Taljaard	Allroads Pty Ltd	Business Development Manager
Rick	Lewis	Altus Traffic	Regional Manager QLD & NSW
Matt	Elischer	ARRB Group	Team Leader (Qld/NT) Heavy Vehicles
Carlos	Rial	ARRB Group	Regional Manager QLD / NT
Kerry	Farley	Arup	Intelligent Transport Systems Manager
Ben	Schnitzerling	Arup	Principal, Infrastructure Commercial Leader, Australasia
Steve	Macann	ATS Infrastructure	Group Construction Manager
Chris	McVicar	ATS Infrastructure	Group General Manager
Marie	Gales	Aurecon	Executive
Paul	Cartwright	AustRail Civil	Director
Warwick	Weeks	Australian Construction Products (ACP)	Qld Sales Manager
David	Bradford	Australian Training Academy	Trainer and Assessor
Jack	Barton	Australian Urban Research Infrastructure Network	Urban Data and e-Research Facilitator
Frazer	McIntosh	BMD Constructions	Project Manager
Jason	Zoller	BMD Constructions	Construction Manager
Jessica	Allison	Brisbane City Council	Policy Liaison Officer
Ronald	Galiza	Brisbane City Council	Congestion Reduction Officer
Joseph	Ho	Brisbane City Council	Project Manager, Project Management Branch
Stephen	McGrath	Brisbane City Council	Manager Planned Incident Management
Russell	McGregor	Brisbane City Council	Senior Communications Specialist, ITS
Steve	Murnane	Brisbane City Council	Design Manager, Signals
Samira	Saliminamin	Brisbane City Council	ITS Electrical Design Engineer
Adrian	Schrinner	Brisbane City Council	Deputy Mayor and Chairman of Infrastructure
Shane	Enchelmaier	BrisConnections	Manager Customer Service & Tolling Operations

First name	Surname	Organisation	Title
Joseph	Lin	BrisConnections	Operations & Maintenance Engineer
Alex	Pushkareff	BrisConnections	Manager Tolling Systems
			Trade Commissioner
John	Williams	Canada Consulate General	
Justin	Jahnke	Cardno	Project Director, Traffic & Transport
Bolle	Borkowsky	CDIF Group	Managing Director and Principal Engineer
Ruiwen	Kong	Cement Concrete & Aggregates Australia	Engineer Construction Solutions
David	Ahern	CMC	Managing Director
Stacey	Rawlings	Consult Australia	State Manager - QLD
Tristan	Jenkins	CV Services Group	General Manager
Mark	Johnson	CV Services Group	Business Manager - Intelligent Transport Systems
Philip	Blake	Department for Transport, Energy & Infrastructure	Manager Traffic Operations, Metropolitan Region
Melanie	Gardiner	Department of Infrastructure and Regional Development	Asst Director
Michael	Sutton	Department of Infrastructure and Regional Development	General Manager
Ted	Beak	QTMR	Project Manager - Traveller Information
Andrew	Causley	QTMR	Principal Engineer (Electrical)
Steve	Enticott	QTMR	Contract Project Director
Lachlan	Faulkner	QTMR	Senior Policy Advisor (Traffic System Management)
Denis	Floyd	QTMR	Principal Project Manager (Traffic Systems)
Charles	Goh	QTMR	Senior Tech Traffic & Electrical Team
Andrew	Golding	QTMR	Director (Transport System Asset Management)
David	Gyles	QTMR	Principal Analyst
Govind	Hapalia	QTMR	Engineer (Electrical) ITS & Electrical Road Operations
Manu	Hingorani	QTMR	Principal Engineer (ITS)
Robert	Hodges	QTMR	Principal Engineer
Brendan	Hoyle	QTMR	Manager (Road System Strategy) Road and Rail Strategy
Niko	Limans	QTMR	Manager/Principal Engineer (Electrical & ITS) Traffic, ITS & Electrical Unit
Lindsay	Locke	QTMR	Manager
Geoffrey	McDonald	QTMR	Program Manager
Mark	Mitchell	QTMR	Director (Compliance & Industry Authorisation)
Julie	Mitchell	QTMR	Chief Engineer

First name	Surname	Organisation	Title
Habeeb	Mohamed-Hussain	QTMR	Senior Engineer (Civil) South Coast Region
Charlie	Palupe	QTMR	Senior Advisor Strategic Policy Policy and Planning Branch
Kris	Panagiotopoulos	QTMR	Director
Jonathon	Perrett	QTMR	Principal Advisor Road and Rail Strategy
Craig	Rossiter	QTMR	A/Senior Advisor Strategic Policy Policy And Planning
George	Schwerin	QTMR	Principal Engineer (ITS)
Rod	Smith	QTMR	Senior Policy Officer
Mike	Stapleton	QTMR	General Manager Land Transport Safety
Wei	Teo	QTMR	Electrical Engineer RoadTek (South)
Neil	Todd	QTMR	Senior Policy Officer
Santosh	Tripathi	QTMR	Principal Engineer
Bradley	Tubb	QTMR	Director
Jason	Venz	QTMR	Principal Engineer (ITS Standards & Practices)
Dennis	Walsh	QTMR	Executive Director (Road System Operations)
Terrence	Webb	QTMR	Principal Project Manager
Andrew	Wheeler	QTMR	Director (SEQ Operations)
Rob	Zanchetta	QTMR	Principal Engineer (ITS & Electrical)
William	Lee	QTMR	Engineer (Traffic)
Osman	Sivac	QTMR	Supervisor - ITS/Electrical
Mark	Mackay	Downer Australia	Executive General Manager North East
Rob	Gilmore	Downer New Zealand	Executive General Manager
Madeleine	McManus	Engineers Australia	National Councillor
Keven	Bascombe	GHD	Principal Engineer - Transportation & Civil Projects
Mike	Hammer	GM Holden	Manager - Vehicle Regulations and Certification
David	Hayward	GTA Consultants	Senior Project Manager
Casey	Lee	Hill and Smith Pty Ltd	Design Engineer
Gerard	Madam	IDM	Business Development & Operations Manager
John	Dignam	Ingal Civil Products	Managing Director
Adam	Game	Intelematics	Chief Executive Officer
David	Johnston	Intelligent Transport Services	Director
Susan	Harris	ITS Australia	Chief Executive Officer
Simon	Davis	Jacobs	Manager of Insights and Communication
James	Gleeson	Jacobs	Civil Engineer
Alexander	Pollock	Jacobs	Senior Consultant - Traffic and Transport
Paul	Rendle	Jacobs	Snr ITS Engineer
Tim	Charleson	John Holland	Structures Manager
Darren	Morgan	Johnstaff Projects	Principal

First name	Surname	Organisation	Title
Richard	Peace	Johnstaff Projects	Senior Project Manager
Ivan	Heigan	Kapsch TrafficCom	Operations Manager
Santiago	Estrada	KBR	Team Leader Roads & Civil
Aidan	Brannan	Laing O'Rourke	Area Manager - Northern Region
Gary	Cowley	Leighton Contractors	Manager Motorways & Tunnels O&M Services Division
Brett	Lehmann	Lend Lease	National Survey Manager
Ashok	Shekhawat	Lend Lease	Operations Manager ITS
Phillip	Walsh	Lend Lease	Business Development Manager - Roads
Dan	Woolcott	Lend Lease	Commercial & Risk Manager
Peter	Fitzgerald	Lend Lease	Traffic Manager
James	Yerbury	Lend Lease Engineering	Business Development Manager
Carl	Bayer	Logan City Council	Traffic Program Leader
Ashish	Shah	Logan City Council	Road Asset Management Program Leader Road Infrastructure Planning
Maree	Pateman	M A Pateman	Trainer and Assessor
Jess	Englart	McConnell Dowell	Proposals/Business Development Coordinator
Olaf	Olsen	McConnell Dowell	Estimator
Marcus	Burke	National Transport Commission	Project Director
Glenn	Geers	NICTA	Technology Director
Peter	Parnell	Norman Disney & Young	Manager Infrastructure
Kim	Thomas	Parsons Brinckerhoff	Technical Executive, ITS, Transport Infrastructure Australia & New Zealand
Nicole	Crowe	Queensland Cyber Infrastructure Foundation	Marketing Officer
Franz	Eilert	Queensland Cyber Infrastructure Foundation	Industry Programs
Shiven	Shah	Queensland Motorways	Senior Engineer (ITS)
Terry	Sullavan	Queensland Motorways	Roadside Lead
Jennifer	Thompson	Queensland Motorways	Executive Assistant
Ashish	Bhaskar	QUT	Lecturer
Edward	Chung	QUT	Centre Director - Smart Transport Research Centre
Sebastien	Demmel	QUT	Research Associate
Leith	Hayes	QUT	Business Manager
Stephen	Kajewski	QUT	Head of School, Civil Engineering & Built Environment, Sci & Eng.
Arun	Kumar	QUT	Professor
Gregoire	Larue	QUT	Postdoctoral Research Fellow
Marc	Miska	QUT	Senior Research Fellow
Tristan	Perez	QUT	Professor in Robotics
Hasti	Tajtehranifard	QUT	PhD candidate

First name	Surname	Organisation	Title
Takahiro	Tsubota	QUT	PhD Candidate
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Michael	Roth	RACQ	Executive Manager Public Policy
Mark	Di Val	Roads and Maritime Services	Concept Design Manager
Ken	Kanofski	Roads and Maritime Services	Director Journey Management
Craig	Moran	Roads and Maritime Services	General Manager Traffic & Safety Management
Mandi	Mees	Roads Australia	National Policy Manager
Lauren	Streifer	Roads Australia	Operations Director
Peter	Watson	Roadverge Australia	General Manager
David	Freer	SMEC	Principal Transport Planner
Tim	Jennings	SMEC	Manager - Intelligent Transport Systems
Bennetts	Ian	Sofgineering	Manager / Director
Russell	Whale	Transfield Services	Executive Manager, Transport Infrastructure & Technology (ITS)
Armin	Kappes	Transmax	Senior Business Development Manager
Michael	Watts	Transmax	Business Development Director
David	Yee	Transport for NSW	Manager, Strategy and Portfolio
Scott	Connolly	Transport Workers Union	Assistant Branch Secretary
Sarah	Mawhinney	Transport Workers Union	Communication and Campaign Advisor
Michael	Whelan	Transurban	General Manager Operations Excellence
John	Talbot	Turner & Townsend	Director
Robert	Saunders	UGL	Supervisor
Brett	Van Breda	UGL	SEQ BM
Phil	Charles	University of Queensland	Professor
Mark	Hickman	University of Queensland	Professor
David	Thorpe	University of Southern Queensland	Senior Lecturer
Samantha	Goddard	Urban Circus	Business Director
Richard	Dunstan	URS	Associate
Brandt	Callaghan	Visionstream	Regional Business Development Manager
Nathan	Long	WT Partnership	Cost Engineer

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