有效的交通是任何国家的重要组成部分，但对一个地理上和人口上独特的国家如澳大利亚来说，挑战是巨大的。随着人口预计大幅增长——澳大利亚预计在未来40年成为世界上增长最快的工业国家，人口增长率高于印度，这意味着更多的车辆、更多的货物、更多的排放，以及有限的基础设施。目前，地方道路占整个澳大利亚道路网络的85%，90%的货物运输在城市道路中进行。你只需要花一小时在悉尼和墨尔本这样的城市中就能见证这种人员和货物的流动。更糟糕的是，到2020年，澳大利亚的总货物运输量将几乎翻一番，城市客运量将增加约三分之一，非城市客运量将增加约70%。这种增长将对当地的交通基础设施以及道路系统的安全边际提出更大的要求。

这足以让交通经理感到沮丧，但对于澳大利亚的道路未来，我们的朋友正在迎头面对挑战，以创新的技术、前瞻性的思维和强有力的政策，旨在充分利用一个艰难的局面。可持续性是正在进行的方案中的一个关键主题。就像任何英国人可以作证的那样，你不会对澳大利亚成功感到惊讶……
Challenging the ‘bigger and better’ mantra, ITS Australia’s Terry Warin believes that the country’s transportation problems can be directly attributed to its sheer size. And it’s not helped by the uneven distribution of the 21 million population, as the association’s executive director explains in more detail. “As the bulk of the population resides in the cities on the east coast, there are vast distances involved when traveling to Adelaide in the south and Perth in the west,” he suggests that these distances are reflected in the transport links of the country. Further explaining that a combination of a railway network in need of modernization, as well as people’s reluctance to drive through a desert to go cross-country, leave air travel as the only viable transportation option.

As a result, the way forward when it comes to intelligent transportation needs to be decided on a state-by-state basis – a situation that Warin is keen to influence as soon as possible. “Looking into transportation in Australia, one thing is apparent – you can’t ask who’s in charge of transportation, simply because there isn’t anyone in charge of transportation! The states all have their own programs.” But as he goes on to explain, there is one program that is showing the way toward a nationalized approach, and has helped the roads in the state of Victoria (Australia’s smallest but most densely populated mainland state) and beyond run smoother.

“One of our committees is the National Electronic Tolling Committee (NETC),” Warin explains, “and it has fostered and achieved total interoperability on all the toll roads in Australia, leaving drivers just having to worry about one e-tag on the windshield.”

ON THE ROAD TO DSRC?
Warin says that there is plenty more that is being done to bring Australia up to speed with the rest of the world when it comes to transportation technologies. Having seen the advances that have been made with both 5.8GHz and 5.9GHz DSRC in Europe, the USA, and Japan, ITS Australia is pushing the initiative in an effort to reduce congestion as well as road deaths. “We are supporting the introduction of an ITS spectrum at 5.9GHz to ensure that we are able to make full use of the new global technologies that will be fitted to new vehicles. All states have representatives in the Australian DSRC consortium and the federal government, through AustRoads, has agreed to provide funding for trials.”

Warin also believes that DSRC technology will be useful to Australia’s railway crossings. “Victoria has the largest...”
THE UNIQUENESS OF AUSTRALIA IS WHAT ATTRACTS HUNDREDS OF THOUSANDS OF TOURISTS ANNUALLY BUT, SAYS TERRY WARIN, IT’S WHAT MAKES MANAGING TRANSPORTATION SUCH A CHALLENGE

Interviewed by John Challen/Photography by Alexis Kembery

“Looking into transportation in Australia, one thing is apparent – you can’t ask who’s in charge of transportation, simply because there isn’t anyone in charge of transportation!”

number of passive crossings in the country,” he says. “This means there are no lights, no barriers – just signs in front of the crossing. The state government has made some changes, but if we could apply some technology to it, through GPS, we would have a better system of communicating warnings.” These crossings are an issue in every state, he goes on to say. “A member consortium has put together a concept using a combination of simple technologies to either complement rumble strips that are set into the road network up to 150m either side of passive crossings, or used independently. The concept is based on sensors that are activated by a train when approximately 1km from the crossing. The sensors send signals to devices in a number of ways, including roadside signs that indicate a train is approaching, illuminated studs flush-mounted into the center of the road that flash red as a vehicle gets closer to the crossing, an audible signal sent to a vehicle’s radio, which alerts drivers that a train is approaching, and cameras that capture offenders who fail to stop for the warnings. The system will be solar-powered.

SPECULATE TO NAVIGATE Traffic messaging is also growing in popularity with more accessibility planned for drivers. “ITS Australia chairs a consortium that has been given a federal group government grant to do the location tables for Australia, so that we can introduce a TMC (traffic message channel) onto portable navigation devices,” Warin explains, adding that the east coast has already been covered. “There is one provider in the country, but it is taking live traffic feeds for the various road authorities in the capital cities of all Australian states.” This measure alone has gone a long way in reducing congestion, although more is needed. Warin is hoping for inspiration from the upcoming Australian Intelligent Transport Systems Summit, which takes place from November 18-20 in Melbourne. “From this one event, we have to come up with the backbone of a strategic plan for Australia. One of the objectives is to come up with an implementation plan of ITS technology deployments for the next three to five years, and to also look to the next 10 to 15 years. “It’s been five years since ITS Australia produced the E-Transport document, which was a national plan for the integration and deployment of various ITS technologies throughout Australia,” Warin recalls. “This document now needs updating and should form the basis of a new national plan. Given the fact that the states often have their own programs, what we are trying to do is to have a common agreement as to technologies and standards required to take Australia well into the 21st century.” He says the group will be working on areas including license plate and railway signal commonization, cashless public transport, and infrastructure requirements to meet the demands of the new technologies.

“Looking into transportation in Australia, one thing is apparent – you can’t ask who’s in charge of transportation, simply because there isn’t anyone in charge of transportation!”

Overall, though, Warin remains positive for the future, and hopes to welcome the ITS community back to Australia at some point. “We would love to host the World Congress on ITS again, but I doubt that we will see one here before 2017, which is a shame because we have a lot to offer. I know that with our members and our very active board, we can add a lot of value to the bigger ITS picture in Australia and we can play our part in the global ITS community.”

On a more personal note, Warin also has his own goal: “I’d like to be remembered as the guy who asked the right questions and got people thinking about change, because change is certainly something that is needed.”

The uniqueness of Australia is what attracts hundreds of thousands of tourists annually but, says Terry Warin, it’s what makes managing transportation such a challenge.
A better understanding of traffic flow

New technology being trialed on the streets of Sydney could have a big impact on incident response and traffic build-up.

On a signalized intersection to the south of Sydney, NICTA – Australia’s Information and Communications Technology Research Centre of Excellence – has started the first pilot of its kind in the country by installing new and advanced technology to help improve traffic flow at intersections.

“NICTA is developing new technologies for detecting, monitoring and controlling traffic,” reveals the project manager of NICTA’s Smart Transport and Roads Project, Geoff Goeldner. “This is our initial on-road implementation of those technologies.”

Vehicles traveling northbound on the Princes Highway, exiting the Illawarra Highway or turning right onto the Illawarra Highway at Albion Park Rail have experienced extensive delays during peak times in the past. Traffic lights were recently installed at the roundabout that switch on when lengthy queues form in order to help ease traffic flow problems. “Our researchers have developed technologies that take this one step further,” Goeldner continues. “The control systems give a more precise understanding of what is happening on approaches to the intersection.”

The technology being trialed applies real-time computer modeling to identify the onset of queuing, and initiates the switching of the traffic lights to improve traffic flows at the roundabout during peak periods. “It will respond to the first sign of congestion, even before the queues reach the detectors.”

NICTA is making a large investment in smart transport and ITS, including LDW systems, ESC, ACC, and collision warning systems. Early theories put forth to better understand behavioral adaptation tended to focus on the concept of risk compensation, and how drivers control or maintain a given level of risk by changing their behavior in response to changes in the environment. Recent models have considered the impact of driver characteristics to the development of behavioral adaptation.

Certain personality traits have been found to influence whether a driver will be likely to develop behavioral adaptation, by affecting the amount of trust they have in a device. For example, locus of control is a personality trait that relates to an individual’s assumptions regarding responsibility for positive and negative events. Those who believe they are able to act so as to maximize the possibility of positive outcomes while minimizing the negative are described as having an ‘internal locus of control’, while those who believe they are helpless and at the mercy of external forces, luck, or fate have an ‘external locus of control’. Drivers who score high on a scale that measures ‘externality’ are more likely to trust in-vehicle ITS to function.

Better control of traffic lights is key to cutting congestion.

**Behavioral adaptation and in-vehicle ITS**

Dr Christina Rudin-Brown from MUARC asks if humans could become too reliant – or take more risks – in an ADAS future.

The introduction of ITS within vehicles to assist with driving is generally seen as a positive step toward reducing crash risk and improving road safety. But what if these systems were to have unexpected effects on driver behavior that offset – or even negated – any benefits? What if drivers learned to rely on lane departure warnings to keep them in their lane, and ended up driving more often while fatigued or distracted? What if having ESC gave drivers the confidence to drive more often in snowy or icy conditions? What if drivers using adaptive cruise control (ACC) were to use any freed-up mental effort to read or write text messages?

The ability to adapt to novel situations in ways that provide benefit to the individual and/or group is an intrinsic characteristic of being human. In terms of driver psychology, the expression ‘behavioral adaptation’ refers to the collection of unintended behavior(s) that arises following a change to the road traffic system. Although their effect on road safety can be positive, negative, or neutral, it is the negative consequences of behavioral adaptation that are of primary concern to road safety professionals.

Experimental studies using driving simulators or test tracks have found evidence of behavioral adaptation to various in-vehicle ITS, including LDW systems, ESC, ACC, and collision warning systems. Early theories put forth to better understand behavioral adaptation tended to focus on the concept of risk compensation, and how drivers control or maintain a given level of risk by changing their behavior in response to changes in the environment. Recent models have considered the impact of driver characteristics to the development of behavioral adaptation.

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making predictions regarding a device’s capabilities for effective incident management and ensuring that those critical human assets are not overloaded,” Goeldner concludes.

Jim Morris, managing director, Traffic Tech

What’s the latest news from Traffic Tech?
We recently launched our new Pedestrian Switch Pad (PSP) – a pedestrian and bicycle detection pad, which has a tactile surface, is simply glued to a pedestrian ramp and is able to detect the presence and direction of a pedestrian or bicycle that passes over it. The PSP has great acceptance from customers in the USA and Europe.

What are your plans for 2010? We will be showing the Switch Pads, EzyLoops and iStudies at Intertraffic Amsterdam in March 2010 (Stand 11.112). We will also be looking to expand our market share in Australia with the introduction of new, locally made and imported products, such as the iStud range of vehicle detectors.

Tell us a recent success story…
Our Subsurface EzyLoops system has been specified for loop-based classification systems installed into the Gateway Bridge duplication in Brisbane. We will be installing over 100 of the preformed, sub-surface loops into the road, before the final asphalt wearing course is laid.

Where do you see your company in five years’ time? We have a growing product range and expanding international markets and would expect export sales into the USA and Europe to exceed AUS$ million by 2015. We market to prospective customers through participation in international exhibitions, such as Intertraffic. Next year we’ll be promoting our range of EzyLoops, iStudies and PSPs.

Jim Giffin, marketing manager, Aldridge Traffic Controllers (ATC)

What’s the latest from ATC? We have developed a railway level crossing advanced warning sign (AWS4C) to provide motorists approaching a level crossing with advanced warning of an approaching train. They are typically installed in remote, rural roads with high approach speeds, and consist of static warning signs enhanced with flashing yellow lights located up to 200m from the crossing. These are deployed especially where visibility on approach is limited due to geographical or weather conditions. We have also developed a range of traffic signal controllers that are integrated with uninterruptible power supply (UPS) units that provide operational continuity in the event of loss of mains AC power. We have also designed two types of Traffic Signal Controller with UPS products to cater from the smallest to the largest application with 24 Signal Group Outputs. With the first product, our engineers created a single cabinet solution for small to medium intersections that can cater for up to eight signal groups with a maximum load of 450VA.

What are your plans to develop your international presence? We are expanding around the world with controller sales linked to the recent awarding of a SCATS distribution licence. The ATSC4 controller is SCATS-compatible and with many cities looking for more than a traffic controller’s scenario, the SCATS option being supplied by ATC gives impetus to additional controller sales. Geographically the targets for us will center on China, South East Asia and the Middle East – we expect these areas to emerge from the downturn earlier than other regions, giving potential for additional markets to be opened.

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interactions. With approximately 30% of road congestion arising from traffic incidents, it is extremely important that road authorities make the most of the human problem-solving capabilities for effective incident management and ensuring that those critical human assets are not overloaded,” Goeldner concludes.

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In-car technology advances at such a pace that many of us struggle to keep up. But recent research from the Royal Automobile Club of Victoria (RACV) shows that most consumers figure that if the technology is worth having, it will be included in their new car purchase. Unfortunately, this is not the case. The uptake of in-car safety technologies in Australia lags behind many other countries. The life-saving potential of this technology is not being realized because it is not adequately understood by government, by stakeholders, and by end consumers.

The Australian government recently announced that ESC will become mandatory in new car models from November 2011, and in existing models from 2013. Yet ESC first made its appearance on the market in 1995. Thousands of lives have been lost on Victoria’s roads alone since then.

Rod R. Riquelme, project manager, Compusign Pty Ltd

What’s the latest from Compusign?
This year we have developed and supplied two new products. The first of these is the Advance Lane Use Sign (ALUS) – a variable speed limit and lane-use sign hybrid composed of a 32x32 centralized white pixel matrix surrounded by a red LED annulus. There is a red LED cross that extends from the center into the annulus. This is capable of displaying speed limits from 10-110km/h, as well as a whole range of graphical lane-control symbols, such as merge arrows and red lane-closed symbol. The device comes fitted with amber conspicuity devices at each corner. It's available in our Arterial Road VMS and is being installed in the Citylink section of the Monash Freeway upgrade. Our Arterial Road VMS, meanwhile, developed for VicRoads, has a screen resolution of 103 pixels wide by 27 pixels high, and utilizes Avagos extra-high-brightness AlInGaP amber LEDs. It’s due for installation this month (October) as part of Melbourne’s ‘Keep Melbourne Moving’ initiative.

What are the trends in your sector?
There’s a greater requirement for hybrid devices that combine two or more functions into one display. Examples of this would be the Lane Use/Variable Speed control sign and Ramp Metering/VMS Signs that advise motorists of ramp status and freeway travel times. We are also seeing an expansion of the RTA’s protocol for roadside devices into traditional SCATS devices, such as ramp control signs.

Tell us about a recent success story that highlights your ITS expertise…
Our products are being used in most of Australia’s largest ITS projects. For instance, our range of LED display systems are used on the M7 motorway, the Liverpool/Parramatta Busway, and Lane Cove Tunnel in New South Wales. They’re also on the Brisbane Busway in Queensland, and in Victoria there’s the Eastlink Motorway and Citylink. Products used include VMS, passenger information displays, VSL displays, travel-time sign, ramp metering sign, freeway condition sign, and tunnel message signs.

Where do you see your segment of the market in five years’ time?
Display technology is changing at a very fast pace and we are seeing a great range of new display components that are applicable to ITS display products. But there has always been a reluctance to use these components as there is a proven lifetime on existing devices. I believe we will begin to see a move away from the old leaded LED components to surface-mount devices. There are many benefits in using SMD LEDs, particularly in production and display alignment. With increasing need in power efficiency and a smaller carbon footprint, we are already seeing the demise of the old fluorescent tubes as these are replaced by more efficient LED backlights. Display devices will need to be more efficient in terms of the display and drive technology they use, as well as in relation to thermal management.

RACV's Thunuja Gunatillake on a new campaign to raise awareness of ADAS

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+61 7 3355 8700 info@transmax.com.au www.transmax.com.au