

ELEVENTH ANNUAL



ITS Australia
National Awards
2020



Australia's ITS industry
celebrating success and innovation

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itsaustralia
Intelligent Transport Systems

26 November 2020 | Online Awards Ceremony



ITS Australia National Awards 2020

Excellence in Research and Development Award Sponsor



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ACKNOWLEDGEMENT

ITS Australia would like to thank the entrants for their participation in the ITS Australia National Awards program and acknowledge their contribution of project descriptions and images for this Awards Book. This book contains a selection of submissions received.

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Welcome from the Chair



Gino Dompietro

The ITS Australia National Awards recognise the outstanding and innovative work that Australia's ITS industry produces, year after year. Each November, we gather together to celebrate the outstanding accomplishments, not just of our award winners, but of all the individuals, teams, and organisations that work together to continue building upon the success of our industry.

When we all met at last year's ITS Australia Awards in Adelaide, none of us could foresee what 2020 would bring. This has been a year like no other. In turn, this year's awards ceremony will be unlike any that has been held before. Where we would normally gather face-to-face to celebrate at the year's end, this time we will rely on technology to bring us together. The lifeline that this technology affords us, to broadcast the awards, is the same technology that has facilitated much of our professional lives in 2020. Perhaps it is worthwhile recognising that the incredible work nominated for this year's awards is, by and large, work that was completed under extremely abnormal and challenging circumstances: online, teleconferenced, from home. To me, that seems like work truly worth celebrating. That this year saw the largest ever number of award submissions is both an incredibly pleasant surprise, and a hugely encouraging sign of our industry's ability to persevere through the challenges of this year.

This year we introduced some major changes to our award categories, with the introduction of four new awards: the Smart Transport Infrastructure Award; Intelligent Mobility Award; Excellence in Transport Data Award; and Excellence in Research and Development Award proudly sponsored by iMOVE Australia. The change, and these new categories, reflect the dynamic and evolving space in which we all work.

Every year the Judging Panel is tasked with the challenge of shortlisting the finalists from all the outstanding submissions received. That is never simple job. This year we have 40 finalists in the running for six awards. The awards also continue to promote and support up and coming talent. After setting a record last year, with seven finalists for the Young Professional Award, this year we have 10. The award gives the next generation of ITS professionals the opportunity to learn more about the industry and develop their skills. The winner will be provided networking opportunities with peers across Asia Pacific and sponsorship to attend the ITS Asia Pacific Forum next April in Brisbane.

I give a hearty congratulations and thanks to all of our award finalists for your incredible submissions and ongoing contribution to our industry. I also thank our sponsors for their generous support of the Awards and our judging panel who committed their invaluable time, effort and expertise this year.

I look forward to seeing all of you again in 2021.

Gino Dompietro

Chair – ITS Australia National Awards Committee
Principal – Infrastructure Development and Financing, Jacobs

Judge Panel

Gino Dompietro

Chair – ITS Australia National Awards Committee
Principal – Infrastructure Development and Financing, Jacobs

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Chief Executive Officer – HMI Technologies /
Ohmio Automation

Dr Liming Zhu

Research Director, Software and Computational
Systems – Data61 CSIRO

MANAGING CONFLICT OF INTEREST

ITS Australia thanks the Judge Panel for their time and review of submissions. The Judge Panel is comprised of leaders across government, industry and academia. ITS Australia recognise that conflicts of interest may occur, so to protect the integrity and independence of the review process, any judge who has a conflict with a particular entry is excused from reviewing that entire Award category to which the entry/conflict pertains.



Award Categories

Smart Transport Infrastructure Award

Recognises an organisation for their technology innovation delivering excellence in transport infrastructure and network management.

Intelligent Mobility Award

Recognises an organisation or project that delivers innovative transport solutions offering outstanding mobility services for people and their communities.

Connected and Automated Vehicle Award

Awarded to an organisation that has made outstanding contributions towards the deployment of connected and automated vehicles in Australia.

Excellence in Transport Data Award

Awarded to an organisation to recognise their outstanding contribution in the use of transport data delivering outstanding outcomes for the community.

Excellence in Research and Development Award

Acknowledges and congratulates R&D activity undertaken solely or in collaborative research programs that recognises an organisation for their ground breaking transport technology, research, development or innovation. This award is proudly sponsored by iMOVE Australia.

Young Professional Award

This award continues to recognise and encourage the passion and positive contribution an individual has made and is likely to make to the Australian transport technology industry as demonstrated through their early professional life. This award is proudly sponsored by ITS Australia.

Max Lay Lifetime Achievement Award

Recognises an individual who personifies achievement of the ultimate standard for a leader in the ITS field and in the organisations they have led. The award recognises that they are a champion of vision of ITS and its fulfilment within the community. The award is named in honour of Dr Maxwell Lay (AM), an Australian pioneer and ITS researcher, engineer, project implementer and passionate advocate for advancement of ITS. This highly regarded award is considered by the ITS Australia Board of Directors.

This year ITS Australia congratulates Dr Peter Sweatman as the recipient of the Max Lay Lifetime Achievement Award.

Max Lay Lifetime Achievement Award Recipient



Dr Peter Sweatman

Throughout his 30-year career, Dr Peter Sweatman has driven global innovation in transportation research and the application of R&D. He has emerged as an authoritative and respected international voice on connected and automated vehicles, safety, ITS, transportation research and education, and freight technology and policy.

Dr Sweatman's career has traversed Europe and Asia-Pacific as well as the United States. In the United States, Dr Sweatman was a cofounding principal of CAVita LLC—a trusted connected and automated vehicle ecosystem partner for government, industry and academia—which gave him broad experience in transport system R&D in the U.S.

Dr Sweatman is also the former director of the University of Michigan Transportation Research Institute (UMTRI) (2004 – 2015), and the founder and former director of the Michigan Mobility Transformation Center (MTC) (2013 – 2016). MTC opened the unique test facility Mcity in July 2015 and has set the bar for safe, off-roadway testing of automated vehicles.

In 2020, Dr Sweatman relocated from the United States to his native Australia, joining the University of Melbourne as International Enterprise Professor with the AIMES testbed. AIMES, the Australian Integrated Multimodal Ecosystem, is a world-first multimodal testing ecosystem which covers 6km² and over 100kms of local and arterial roads and freeways.

Dr Sweatman also has a lead role in the MAX: Michigan Australia Exchange in Mobility, a partnership between the State of Michigan and the Australian Government to enhance cooperation between respective government bodies, knowledge-based institutions, clusters, and businesses in all areas of future transport research, technology, entrepreneurship and innovation.

The Max Lay Award is named in honour of Dr Maxwell Lay (AM), an Australian pioneer and ITS researcher, engineer, project implementer and passionate advocate for the advancement of ITS.

Road Event Analyser

Category

Smart Transport Infrastructure

Submitting Organisation

Transurban

Road Event Analyser reduces false incident alarms in the traffic control room whilst maintaining a high detection rate. This reduces alarm noise and focus operational efforts on managing the network and less on alarm validation.

Less false incidents alarms leads to:

- Quicker response times: Reducing the need for filtering of events that then need to be detected manually during high false alarm conditions.
- Less workload on traffic control room officers: Reduce operator workload by reducing false alarm checking, and operational stress from too many false alarms.

Road Event Analyser fuses incident data sources to achieve better results than any singular source of data improving the durability of the incident detection function. It can scale to incorporate new data as alternative incident sources emerge and enables improved incident data management, including verification and validation against historical data to manage performance. Instead of relying on a single technology it can adapt to get its data from anywhere and from anything.

The open design philosophy of the Road Event Analyser lends itself to being very transferable as interfaces can be adapted to talk to legacy and new data sources. It leverages the Genetec platform, and transferring the Road Event Analyser to another road asset is possible by assessing available sources of data on that asset and then designing logic that best aggregates that data. Road Event Analyser is the first dedicated system of its kind to aggregate this data together and filter it to improve the confidence that a control room officer is seeing more accurate traffic incident data with less noise.

The Road Event Analyser has been deployed and is running on sections of CityLink.



A Structural Health Monitoring System for the Sir Leo Hielscher Bridge

Category

Smart Transport Infrastructure

Submitting Organisation

Data61 CSIRO

Collaborating Partners

Transurban

University of NSW

Cisco

Innovation Central Sydney

Rockfield Technologies Australia



In collaboration with its research and engineering partners Data61 have designed and developed an advanced sensing and data platform to monitor the iconic old Sir Leo Hielscher Bridge (the Gateway Bridge) in Brisbane in real time. The platform uses machine learning techniques to detect damage before it can affect the public safety.

Transport infrastructure assets like bridges are typically maintained when something goes wrong or according to preventative maintenance schedules. This is risky and inefficient as maintenance is either too early or too late. Current practise involves visual inspection every two years and parts of bridges can be very difficult to access. Our system allows condition-based maintenance and monitors infrastructure in real time using sensing systems and advanced data analytics. It allows the asset owner to understand long-term health trend and prioritize the business to make best use of limited maintenance resource. This can increase productivity, public safety and extend asset life.

The sensing system was instrumented inside the tunnels of the box-girders of the bridge.

This environment is quite benign so it is expected that the system can last for several years. Most troubleshooting can be done remotely over the ethernet network. In case we need to be onsite for troubleshooting system issues or replace faulty hardware, these tunnels are easy to access.

Our cloud-based data platform architecture and the damage detection methods using machine learning are generic and can be applied to any sensing system in any structure to be monitored, given the system predominantly analyses vibration data. Therefore, it is straightforward to adapt the technology and transfer it to other bridges and critical infrastructure.

The system is currently being refined on one span of the Gateway Bridge and planning is underway for scaling up the solution to the whole bridge.

M8 Tunnel Remote Access Testing Solution

Category

Smart Transport Infrastructure

Submitting Organisation

SICE

SICE delivered the OMCS and the ITS systems for WestConnex M8 Tunnel. During its delivery, the COVID-19 outbreak greatly endangered the delivery of the project's Testing and Commissioning. SICE quickly reacted by implementing a secure and reliable remote access solution, which provided the stakeholders with access to the tests without requiring to be physically present.

This remote testing solution enabled the project schedule to advance uninterrupted even if most of the stakeholders and testers are off-site. Thanks to this new development, the testing activities were performed efficiently and safely. This solution eliminated the need of travelling to the project site, eliminating the time and fuel costs, thus making this solution highly sustainable.

The solution can be applied even after the current COVID-19 pandemic is resolved, saving time and money in the logistics of the resources involved in the testing and commissioning activities. SICE believes this solution will permanently change the way Testing and Commissioning activities for ITS projects are carried out, allowing greater flexibility to all relevant stakeholders.

This solution can be easily implemented in other ITS projects, the remote access can be shared by different stakeholders, allowing an easily configurable hand over of the systems when required.

For its implementation, different applications were seamlessly integrated, providing secure access and views of the screens and cameras to the stakeholders and testers:

- Genetec Desk Camera, installed on the testing workstations, enabled all users to monitor the tester's activities in real-time. It was integrated into the existing Genetec VMS system being used for the project. The system archived all sessions for 31 days if the test footage was required to be reviewed.
- Genetec WebClient, used by the registered users on a web browser to access the platform, monitor cameras and workstation cameras.
- Microsoft Teams allowed voice communications between participants.



SAGE Edge – Delivering Valuable Insight and Smart Asset Management

Category

Smart Transport Infrastructure

Submitting Organisation

SAGE Automation

SAGE Edge is a universal IoT data capture device that provides many different capabilities through one device. The SAGE Edge device can be used for multiple applications including SMART City data collection, transport travel time data, tourism pedestrian data and general IoT data management.

SAGE Edge is currently being used by local government, road authorities and tourism operators, supporting positive outcomes through the collection of real-time data. This data can be analysed using custom algorithms for understanding people and vehicle movement patterns that facilitate data-driven planning and support for long-term transport needs. In McLaren Vale, Edge provides real-time visitation data that can be used to improve tourism outcomes, which can be transferred to multiple businesses. Data from the Edge device has also assisted in the quantitative measurement of retail disruption and project success during the civil works revitalising King William Road shopping precinct.

The solution will have lasting impact as it can be coupled with multiple devices and used in many applications, with the ability to leverage emerging detection technologies. It integrates with traffic signals and future vehicle-to-infrastructure communication as it is dedicated short-range communications compatible.

Using non-invasive technology, Edge collects data and integrates with existing API data, which reduces field sensor requirements and associated costs, making it available to a wider market. SAGE Edge can be coupled with additional devices or data sources to deliver valuable insight and asset management for more complicated projects.

SAGE Edge has the highest data sample capture rate in Australia, capturing data via Bluetooth and WiFi Mac addresses. This high level of data accuracy can be transferred to a number of environments, including regional areas where there is less traffic volume on the roads. It has been deployed in a range of traffic network and smart cities initiatives. Significant investment in trials has enabled the device to evolve, with the iterations used in more than 3,000 traffic field cabinets and pedestrian detection installations across Australia.



SCATS Priority Engine

Category

Smart Transport Infrastructure

Submitting Organisation

Transport for NSW

SCATS Priority Engine developed by Transport for NSW helps the flow of priority vehicles through traffic – most recently delivered for the CBD South East Light Rail Project. It is advanced traffic management software that enables the movement of essential vehicles to be prioritised through traffic lights.

Traffic signals are about optimising traffic flow and reducing delays at intersections. However, more recently the view has shifted to recognising that some vehicles are more impacted by delays. SCATS Priority Engine is an innovative software solution from SCATS designed to provide smooth and efficient journeys for public transport, emergency vehicles and freight vehicles. For our customers this means on-schedule arrival of public transport and potentially more efficient freight delivery and faster response times for emergency vehicles if rolled out on a broader scale.



SCATS Priority Engine is part of the SCATS ecosystem of products. In NSW, SCATS Priority Engine is about to be trialled with freight vehicles expanding the use case of the system beyond public transportation (buses and light rail). Trials of the product have also been undertaken in New Zealand and South Australia delivering up to 50% reduction in stops and travel time for public buses.

SCATS Priority Engine is innovative in that it provides:

- Priority to vehicles such as public transport, freight and emergency vehicles when approaching traffic lights.
- Generic interface to SCATS software through which external vehicle tracking systems can request priority.
- SCATS operators more direct control over the priority function than was previously possible.
- Flexible arbitration between different types of vehicles requesting priority.



REView: Intelligent Telematics for Electric Vehicles and Charging Infrastructures

Category

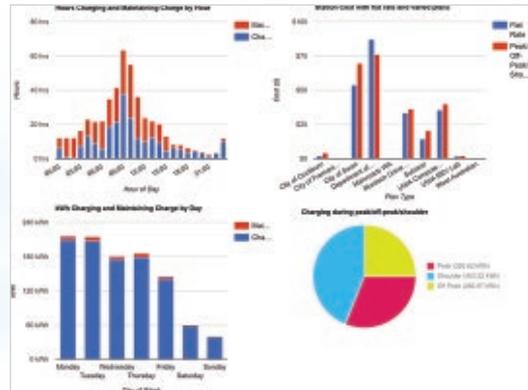
Smart Transport Infrastructure

Submitting Organisation

REV Project, The University of Western Australia

The University of WA's REV Project operates one of the largest electric vehicle (EV) charging station networks in WA, where it is also the largest network operated by an academic institution in the country. This network includes 24 chargers that are located around Perth. Our telematics platform collects individual user data and relay them back to the user in both itemised and statistical form provides a substantial added value for individual mobility.

In Australia, local EV numbers have been growing at a very encouraging rate. This introduces a demand by local markets to understand the impact of this population. With our project, having a connected EV charging station network, as well as a fleet of connected EVs, allows us to effectively anticipate and forecast the growth of EVs around Western Australia. This project connects through the Internet of Vehicles (IoV), which minimises the need for conventional ground surveys to ascertain local driving and charging behaviour.



In addition to monitoring and visualisations, our telemetry data has resulted in peer-reviewed academic publications and governmental reports that have been used to forecast and plan charging network usages. Our system is built on open source and free software for replication ease, and as opposed to private, for-profit station network operators, we regularly publish our system through academic manuscripts, and openly make our data available.

As an academic project, we highly encourage the collaboration of similar projects that enable the sharing of EV data to better understand and stimulate EV adoption through the publication of our data and framework, providing an end-to-end description covering both hardware and software implementations. Topics include communication protocols, hardware/software configuration and data frameworks. This contrasts with almost all other fleet and charging station networks that are owned by private entities, which heavily restricts the accessibility of their system and data. Despite the demand, this restriction deprives local markets and governments from necessary information to spur uptakes for sustainable transportation.

Canberra Light Rail

Category

Smart Transport Infrastructure

Submitting Organisation

ACT Government – Major Projects Canberra

Collaborating Partner

Canberra Metro

Canberra's Light Rail is a world-class public transportation system that promotes urban regeneration and social benefits. It has achieved remarkable outcomes, having been progressed by a small jurisdiction with no previous light rail experience. It has boosted Canberra's sustainable development by improving transport options, settlement patterns and employment opportunities. With 12km of track, 13 stops and 14 vehicles, it is the most significant infrastructure project undertaken by the ACT Government.

Sustainability and safety were central to the design and delivery approach of the project, with some initiatives a first for the ACT and Australia. The project used a soil-binding polymer floc to manage disturbed land during construction. An innovative spray-on soil-binder was developed to address the clean water discharge criteria and construction erosion and dispersive soil, leading to a reduction in water consumption and airborne dust during works, and improving revegetation times.



The Canberra light rail project has sought to improve sustainability knowledge and practice within the ACT Government and Canberra Metro, demonstrating a lasting impact on local industry. Sustainable initiatives and innovations were shared to the industry through Environmental Dashboards, intranet homepages and portals, and general outreach material, including construction industry events.

Given that the scale and complexity of the Light Rail Project had not previously been seen in the ACT, the potential for knowledge transfer is vast, and the experience of the project will transfer understanding of key issues and risk areas to other similar projects in the ACT and Australia.

Canberra's light rail has helped drive a 32% rise in public transport usage in the city's inner north and enhances Canberra's status as a great place to live and work. Light rail has successfully integrated with the fabric of the city to create a more liveable space, providing high levels of access and mobility and shapes a more compact and walkable city.



Operational Deployment of Semi-AVs and C-ITS on EastLink Tollway

Category

Smart Transport Infrastructure

Submitting Organisation

Department of Transport

Collaborating Partners

ARRB

Centre for Technology Infusion,
La Trobe University

Eastlink

The VicRoads Smarter Journeys program developed and deployed a DSRC messaging platform to deliver real-time road warnings in a high-speed environment. The trial demonstrated that messages can be delivered with precision (location and lane) and reliability without interference with the tolling system, which were the key metrics of this project. The ability to provide instant and advanced road warnings to connected vehicles ahead of incident/roadworks warning signs along the road delivers clear safety and efficiency benefits. This is an important step towards ITS's promise of dynamic demand-response traffic management.

The project demonstrated this ITS solution is feasible and the project shares a set of best practices on the development, design and deployment of connected and smarter roadside infrastructure catered specifically to real-time situations. It identified that if communication devices are installed in accordance with specifications such as wireless signage, safety implication and functionality requirements, connected automated vehicles on public and private roads can be ready

to make a significant contribution towards reducing congestion, improving safety and more pleasant journey experience (with real-time advanced messaging onboard).

The innovation of the C-ITS trial lies in that it delivered a platform for C-ITS that is not commercially available yet. The exact distance to the warning site (eg. accident) is communicated in real-time, over the distance of gantries with a novel RSU to RSU link, which is a technological feat extending the reach of the messages.

The vehicle accident warning and roadworks warning platform proved to be accurate, stable, and reliable in real-time. Once connected vehicles are ready to accept these messages, the system can easily be scaled to meet the requirements. Additionally, this project initiative has provided valuable learnings on the interaction between the vehicle and its surrounding infrastructure that will greatly assist with future deployments.



Road side Unit on Gantry



Modules in Vehicle



User Interface In Vehicle

Dynamic Transport Optimiser

Category

Smart Transport Infrastructure

Submitting Organisation

Opturion

Collaborating Partner

AFS Logistics

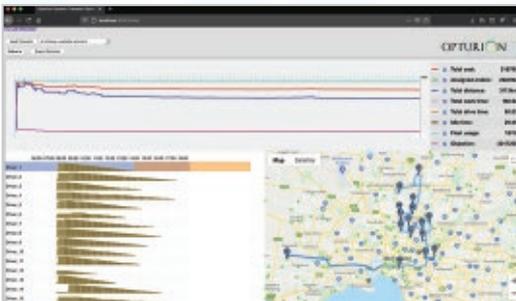
Opturion and AFS Logistics have collaborated to produce a completely autonomous solution for transport optimisation. The MOVEIT solution from AFS processes customer orders and creates optimised routes and schedules that can be communicated directly to the transport provider, or even the drivers themselves.

Our ITS system enables us to broker transport allocation effectively, achieving optimal outcomes for all parties. Its ability to optimise allocation of orders to different fleets reveal, not just cost for a decision, but optimal cost, achieving the best assignment for every order. One key impact is to avoid subcontractors maximizing income at the cost of their health and alertness, and increasing the risk of accidents. Increased margins enable drivers to be rewarded for an ordinary, planned, day's work. Another impact is that deliveries actually meet their time windows since drivers are allowed ample time to meet their deadlines.

The technology has been deployed in a wide range of business applications: interstate transport; depot to customer last mile; pick-up and delivery; FMCG, refrigerated, bulk liquids, palletised, containers, patient transfer, workforce deployment and others. It is also in use in warehouse management and rostering shift workers. The combination of these applications enables our ITS system to optimise the whole logistics problem including storage, transport and people. The system is also used for production management, which means the whole supply chain could be optimised.

AI has developed new ways of optimisation which can cope with the details of each application as people do – but with incredible speed, accuracy and consistency. This application deploys AI-based technology developed in Australia which enables complex applications to be modelled easily, modified quickly when necessary, and extended to handle real world requirements and constraints which cannot in practice be handled by mathematical programming.

The unique selling point has been the speed of deployment, accuracy of modelling, and minimal deployment effort, making the AI-based ITS system an order of magnitude faster and cheaper to deploy and maintain.



Waverley Council Pick-Up/Drop-Off PUDO bays

Category

Smart Transport Infrastructure

Submitting Organisation

Waverley Council

Collaborating Partner

Transport for NSW

Waverley Council and Transport for NSW are making it easier for people to travel safely with our newly installed pick-up drop-off (PUDO) bays. PUDO bays provide safe access for ride share vehicles, taxis and the general public to pick-up and drop-off passengers safely in high traffic areas, with two endorsed mobile apps connecting them to the bay locations.

The new pick-up/drop-off bays in the Waverley Council commercial areas aim to efficiently coordinate PUDO activities across the LGA. By using not only physical counts, but also advanced data collection tools, council will be able to analyse number of trips started or ended on the PUDO bays, trip's destination, safe use of space and behavioural change towards safer use of kerbside space. Council will also be able to measure environmental impact of new trips vs local car ownership rate. It is also planned to install physical counters to identify type of vehicle doing the PUDO activity and number of passengers.

Evidence based decision making will have a lasting impact on kerbside analysis and response to future mobility needs. Activities such as parking, loading, collections, happen at the kerbside. New disruptive technologies have increased pressure to provide more efficient and lasting services. Through analysis of transport providers data sets, council identified potential PUDO bay locations, which were matched with outdated on-street bays that could change use without affecting current activities.

Local councils across Sydney are interested in the benefits of PUDO bays. A scalability model will be created to make PUDO bays the new normal in busy commercial areas in NSW and Australia. The shared economy is growing faster, and councils will need to have a response to the increasing pressure generated by the new mobility apps and the shared economy. PUDO bays and data analysis are a real option to help solve the kerbside space issue.



Opal Connect

Category

Intelligent Mobility

Submitting Organisation

Transport for NSW

Opal Connect is an innovative payment platform incentivising customers to make best use of local public and private transport services. It incentivises customers to leave the car at home by using On Demand services for 'first and last journey miles'. It is a digital channel allowing customers to pay for privately operated On Demand services and to earn Travel Credits.

Opal Connect is Transport for NSW's gateway to Mobility as a Service (MaaS) and is working towards transitioning public transport payments to account based ticketing (ABT). Where data will be stored on a customer's account instead of stored on a card-based token. This enables customers to benefit across all transport services. It has been rigorously tested to satisfy customers, operators and is fully PCI compliant. Opal Connect is robust, flexible and future-ready. At the next stage Opal Connect will be supporting more services including Park & Ride, the Opal digital card and ticketing subscriptions.



On Demand services have been the first trial for Opal Connect. The first service was tested in one small area then extended. Customer reaction, product processes and systems fed back into iterative development. Each service requires close collaboration in Information Technology, Revenue Management, Service Operations and Marketing. Excellent results pave the way for adaption and growth.

Opal Connect is a brilliantly conceived concept of an account-based ticket service addressing unmet customer needs expressed in market research. It makes it easier for transport customers to plan, forecast and reconcile transport spending. Towards an overall goal of incentivising customers to use public transport.

The Opal Connect platform has been designed and built in-house responding to unmet customer transport needs. Bringing together diverse teams focussed on constantly changing customer needs.

Strong and effective collaboration with our customers, transport operators, customer communities, technology and marketing demonstrates strong and effective innovation.



Moving the Mark for Mobility

Our vision is to make mobility easy and accessible to all. Our portfolio of products empowers transport agencies to make transportation safer and more efficient for drivers, equipment installers and maintainers, public transport users, and vulnerable road users. Whether your focus is an intersection, a corridor or an entire city, Cubic can help you optimise your network.

Getting you There. Smarter.



CUBIC



Trafficware



GRIDSMART

cubic.com/transportation

On Demand Public Transport Pilot Program

Category

Intelligent Mobility

Submitting Organisation

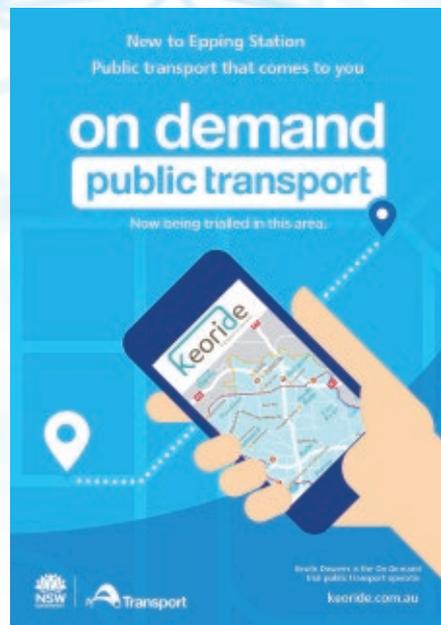
Transport for NSW

Transport for NSW's world-leading On Demand public transport pilot program has seen the successful deployment of 22 On Demand trials across NSW. This extensive set of trials has allowed Transport for NSW to thoroughly learn and understand how this innovative technology-driven transport model can improve customer outcomes and increase network efficiency. Due to the success of the program, permanent On Demand services are being integrated into the wider transport network.

The ability for the On Demand service model to respond to real time customer demand provides an efficient and cost effective way of delivering public transport. By allowing customers to book a public transport service via an app to come and pick them up near their home and take them to a transport hub, at a time of their choosing, On Demand is an evolution in the way transport and customer services are delivered.

Customer satisfaction surveys have shown a strong preference for On Demand over alternative methods of travel, citing the level of convenience it offers to be a key draw. On Demand also offers greater value for money compared to traditional bus as it is able to provide a much higher level of customer service for a similar cost.

Each On Demand service is unique based on the customer need it is designed to fulfil. The flexible and responsive nature of On Demand has always been a core strength of the service model. This came to the forefront in the face of COVID-19 restrictions when the innovative and adaptive technology behind On Demand enabled services to swiftly adjust their model – by adding new destinations such as supermarkets and medical centres – to assist customers with their essential travel. The introduction of the integrated payment system Opal Connect onto On Demand services was another innovation. Opal Connect provides frictionless ticketing to customers as they transfer between On Demand and other modes of public transport.



Protecting Vulnerable Road Users while Promoting Sustainable Transportation: Q-Free's Cycle Priority and Safety Program

Category

Intelligent Mobility

Submitting Organisation

Q-Free Australia

Q-Free's purpose is to optimise the movement of people, goods and data whilst stimulate sustainable transportation and improving road safety. Increased traffic in cities as well as mandates to lower pollution levels are driving changes in transportation policies. Using sustainable power, Q-Free's bicycle and pedestrian monitoring technology detects and protects vulnerable road users in multi-modal environments via integration with traffic signals and safety warning signs. In addition, authorities can both motivate and communicate with their community while stimulating their sustainable transportation goals using outdoor active information displays.

More and more people are shifting to active transport. We have seen this trend over some time including during the COVID-19 pandemic. In all new major infrastructure builds, the Government factors in active transport. The Q-Free Bike and Pedestrian Priority and Safety System can be transferred and installed in every state and local council across Australia to provide a safe, sustainable, and efficient mode of travel for vulnerable road users.

We use an innovative approach where multiple technology functions are used rather than a single technology stack - creating new business capabilities by intelligently and creatively integrating them.



The system provides high accuracy across mixed traffic lanes in any type of weather. Our solution is the only on the market that can accurately and consistently detect cycles on approach with no false triggering by pedestrians or other vehicles. Detection equipment can be integrated with all traffic signal controllers in Australia. It can be configured for directional travel detection and integrated in traffic environments to alert motorists and pedestrians of cyclists.

The HI-TRAC@CMU is a highly accurate bicycle and pedestrian monitoring system that:

- Detects vulnerable road users in multi-modal environments.
- Protect vulnerable road users in multi-modal environments via integration with traffic signal controllers.
- Supports wider efforts to build more sustainability into personal mobility.
- Operate effectively with sustainable power supplies.

Ambulance Victoria Next Generation ITS Solution

Category

Intelligent Mobility

Submitting Organisation

Directed Technologies

Responding to the mission-critical needs of emergency responders, this Australian designed and built Ambulance Victoria connected vehicle ITS solution is deeply embedded into the vehicle electronics and onboard body auxiliary systems, generating unprecedented mission-critical telematics insights into safety system activation, occupant detection, and emergency equipment charging status. Coupled with cloud analytics, the data and learnings have led to improved safety outcomes for paramedics, patients, and the public – thus helping to save lives.

Ambulance Victoria prides itself on giving patients the right care at the right place at the right time. For the first time, it is now possible to remotely monitor when ambulances are operating under emergency response scenarios ensuring optimal resource allocation and utilisation.



The system has universal application across all types of emergency vehicles and different vehicle body data modules and fit-outs.

Designed and developed in Australia, it can be rapidly adapted to pick up other on-board digital CAN BUS signals as required. It has been integrated with Mercedes Benz, Toyota, Ford, VW and Nissan vehicles demonstrating rare integration across vehicles from all global regions for export development. Exciting potential advancements include use of NBIOT to monitor high-value moveable assets, eg. oxygen cylinders or defibrillators to alert paramedics of the absence of these prior to departing the scene.

While connected technologies are used in vehicle dispatching systems, they are rarely deeply integrated with the vehicle and body auxiliary systems nor onboard equipment monitoring. With rollout to over 1,200 Ambulance Victoria emergency services vehicles operating across 227,000 square kilometres in the State of Victoria well underway, data insights are already emerging for optimal service reminders, daily trip views, and uptime availability of ambulances. If a vehicle is diverted due to an accident, the job will be transferred to another vehicle. Prior to deployment, the paramedic had to manually update his status on the dispatch system. Easy to forget when saving lives. The telemetry system provides this information about the vehicle to the fleet management team seamlessly.



TripGo API, SDK and White Label

Category

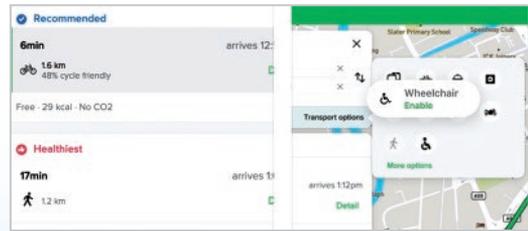
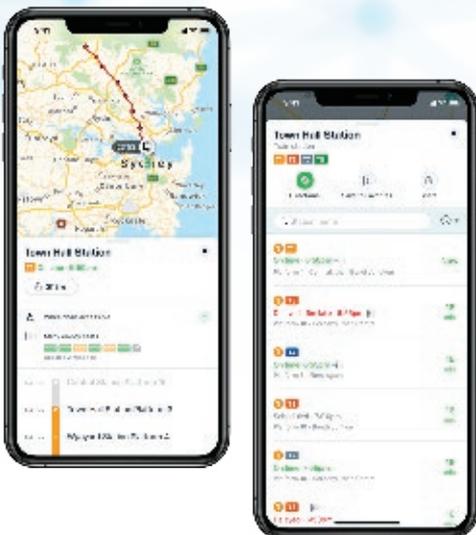
Intelligent Mobility

Submitting Organisation

SkedGo

SkedGo provides groundbreaking Mobility as a Service technology. Our award-winning solutions enable governments, corporations and startups to provide greener and more accessible transport routing to their citizens, employees and customers. SkedGo's unique proprietary algorithms support more connected, inclusive and sustainable travel. Born from a desire to reduce single occupancy car use, SkedGo's routing algorithm aggregates all available transport modes to provide travellers with mobility options tailored to their personal preferences, including:

- Travel data searches to reduce car use.
- Visibility of carbon emissions from journeys.
- Access to accessibility information on trip chains.



The software is in use within Australia, Europe, the UK, North and South America and is constantly growing. Up until the end of 2019, SkedGo reached approximately 2 million people worldwide with its technology.

Inclusivity and sustainability are central to SkedGo's ethos and technology and it relies on the support of third-party data. For instance, Transport for NSW open data strategy allowed SkedGo to include wheelchair-friendly routing and notify passengers which parts of the platform provided emptier carriages. Using this data via the SkedGo platform collaborative research centre AutismCRC created an app to help people on the Autistic spectrum be more comfortable using public transport.

SkedGo has scaled from its HQ in Australia to Vietnam, Argentina, Germany, Finland and the UK to help its growing client base. To increase the scalability and replicability of the technology even further, SkedGo is also launching a templated version of its software. This will allow public transit authorities to provide a branded MaaS web or mobile app to their communities/citizens within weeks, significantly reducing the time and cost of bringing this service to market.

Keolis Downer On Demand Transport: A Key Enabler to Integrated Journeys

Category

Intelligent Mobility

Submitting Organisation

Keolis Downer

Collaborating Partners

Department for Infrastructure and Transport
Transport for NSW
City of Newcastle

Keolis Downer operates three On Demand services in NSW - two On Demand transport projects for Transport for NSW in Northern Beaches and Newcastle and one OD with City of Newcastle as well as two On Demand transport trials for the SA Government in Mount Barker and Barossa Valley. Keolis Downer aims to unlock the full value of existing transport networks while personalising transport services for a better customer experience.

The social impact On Demand transport has on the community is life changing. 42% of customers from our Northern Beaches trial would ditch their individual car to use On Demand Transport, while 86% of customers from our Mount Barker trial said On Demand Transport benefits the community. These trials have reduced customers reliance on car ownership by linking these services to public transport networks, gives a sustainable transport

solution and supports the growth of public transport networks. Customers know they can track their vehicles from the palm of their hand, providing a great sense of convenience, flexibility and safety.

Our trials in Northern Beaches and Mount Barker have both been extended due to the continued support from the community. The Northern Beaches framework was transferred to our SA trials using the same principles while adopting the same Keoride brand. The engagement strategy to implement these services and constantly monitoring feedback to adjust the service was also used in NSW and SA and is transferable.

A high level of expertise is required when designing an On Demand service and understanding what customers want in order to adjust the service is critical to success. In the future, these flexible modes of transport, coupled with driverless vehicles, will offer the opportunity for more first and last mile solutions to increase the use of public transport and adapt the service to community needs.



Matilda – The Smart Transit Hub Improving Accessibility

Category

Intelligent Mobility

Submitting Organisation

SAGE Automation

Matilda is a portable, connected transit hub that caters for passengers based on their individual abilities, providing efficient, personalised and safe services. Equipped with smart technology, Matilda is key enabling infrastructure for transport services to be safer, more accessible and flexible. Matilda's assistive features enhance accessibility and user experience, increasing independence for aged care and disability groups while integrating services for more efficient transport.

Matilda's human-centric approach and assistive features were well-accepted by the community, with rider survey data indicating more than 99% of users felt safe using the hub. Accessible features including cognitive voice assistance, real-time sign-language interpretation and screen rotation were well-utilised during the trial.

The technology used within the hub is transferrable, with the technology platform transferred to smart city zones. The smart screen has been transferred to a digital kiosk, and integrated into local government areas, such as King William Road, to improve public wayfinding and access to nearby services. The technology platform can be integrated into existing stops, aged care communities and parks to provide greater value for the community while enabling data collection for effective planning. Matilda's features are designed to enhance user experience and to make public transport more accessible for a wider group of people.

Matilda brings together connected vehicles, AVs and communities, improving accessibility for all users. SAGE collaborated with Royal Society for the Blind during building, testing and validation of the hub to meet smart mobility needs. Through partnerships, enabling technology includes T-coil hearing loop, KinTrans sign language interpretation and an interactive screen with intuitive display.

The technologies used in Matilda offer benefits to wider markets:

- Wayfinding software used for digital kiosks in parks, gardens and city.
- CCTV solutions used in the Royal Botanic Gardens, Melbourne.
- SAGE Edge provides visitor estimates for tourism operators.
- Pedestrian detection units provide baseline of pedestrian traffic in and around the transit hub.



Cooee Busways

Category

Intelligent Mobility

Submitting Organisation

Busways

Collaborating Partners

Transport for NSW

Via

Cooee Busways is an on demand public transport service operated by bus operator Busways in partnership with Transport for NSW and Via. Using the Cooee app, customers are able to book their bus ride at a time that suits them, connecting with metro and rail or the local shopping centre safely and efficiently.

Cooee Busways has continued to lead the world through payment and trip planning integrations, dynamic customer focused functionality and responding to COVID-19 impacts. Cooee Busways has been integrated into OpalConnect with customers benefiting from integrated ticketing. Cooee Busways provides customers with a choice between On Demand or up to five local bus route services and has responded to customer and community needs by adding additional destinations and responds to accessible transport requests. Cooee Busways has implemented physical distancing restrictions during COVID-19, ensuring that maximum capacity can't be breached. Contact tracing is possible due to the booking nature of the service.



The payment integration of OpalConnect is an Australian first using account based ticketing to provide customers with greater choice and benefit when having a multi-modal trip. Customers can choose the best combination of public transport services without a cost imposed. Cooee Busways demonstrates that customers will interact with technology if it enables a greater or easier travel experience. The use of dynamic transport solutions allows the transit operator or agency to influence consumer behaviour for greater network optimisation. Cooee Busways demonstrates how multiple customer cohorts can be reached by nuancing the service at different levels, meeting differing customer needs.

Cooee Busways has completed over 100,000 rides in just over a year with ridership returning strongly during COVID-19 due to the safety precautions put in place. Cooee Busways remains the fastest growing On Demand service launched in Australia and one of Via's fastest growing on demand services out of their more than 80 deployments worldwide.



On-Demand and Last Mile Mobility for Goods and Services

Category

Intelligent Mobility

Submitting Organisation

Research Centre for Integrated Transport Innovation, University of NSW

Collaborating Partner

Adiona

We have initiated an industry-oriented research program with Adiona a leading start-up in optimisation technology for mobile workforces in industries such as mobile services, field forces, logistics and supply chain. The outcomes of this research project are enterprise-grade, stable, dynamic, real-time optimisation algorithms that will be built into a cloud-based Optimisation-Software-as-a-Service (OSaaS) platform, with high-impact commercial potential within Australia and overseas including a fast-growing addressable fleet management software market.

Funding was secured from the Australian Research Council for a 3-year Linkage Project entitled Stable on-demand optimization for workforce and fleet logistics management during the period 2020-2023. This project aims to conceive, develop and deploy innovative methodologies for on-demand workforce management and fleet logistics based on advanced decision-support systems.

Over the past years, Adiona has hired two graduate students from the Masters in Transportation Engineering program at University of NSW. This continuous exchange of talents has resulted in substantial transfer of knowledge between academia and the industry which is expected to improve the state-of-art in the practice and the development of ITS technology.

The overarching goal of the project is to conceive, develop and deploy new solutions for on-demand pickup and delivery/dropoff vehicle routing problems. The outcomes will be deployed in the proposed OSaaS platform, providing an online and scalable decision-making solution to its end users to strategically arrange their fleet logistics and workforce.

Workforce and fleet logistics stand at the heart of urban societies. Yet, existing logistical solutions often ignore key practical considerations of urban logistics such as on-demand capability and varying traffic conditions. UNSW rCITI has worked hand in hand with Adiona to advance the development of on-demand optimisation solutions and its potential to improve urban logistics. The ongoing partnership between UNSW rCITI and Adiona is expected to lead to the successful development of game-changing optimisation technology for retail, delivery and mobile fleets industries.



Tram Priority Project

Category

Intelligent Mobility

Submitting Organisation

Department of Transport

Collaborating Partners

ARRB

Centre for Technology Infusion,
La Trobe University

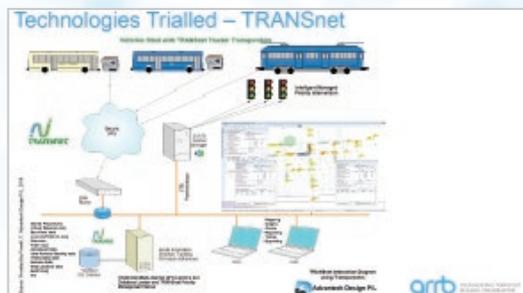
Yarra Trams

The Tram C-ITS Signal Priority project deployed a combination of virtual detectors, innovative algorithms and connected technologies to request traffic light priority for trams. The current in-road detector requests priority 100% of the times, many of which the tram is unable to use. Our ITS solution provides more options for road managers, eg. it only requests priority when behind schedule or when the 'stop' button has not been pushed. Conditional priority requests reduced the total number of priority requests by two thirds, resulting in less disruption to other road users.

The project identified how to interface emerging technology to SCATS, trams, and roadside infrastructure, to deliver conditional tram priority. This allowed the investigation of communication-based technologies, which were found to enable the delivery of more diverse and flexible priority based on tram status (eg. early, late, door open/closed). It was found that the strengths of the systems trialled should be integrated into a hybrid system, utilising the physical detector for point detection and for advanced detection and conditional priority management as well as C-ITS 5.9GHz DSRC interface for its ability to place and cancel requests based on tram status.

On-board units were installed on the trams to enable monitoring and smarter decision making. These technologies could be easily transferred to other on-road based public transport as well as other vehicles which road agencies wish to provide priority, including emergency vehicles and freight. As the systems integrate with SCATS, there is the potential for integration across other jurisdictions.

The technologies were assessed as part of the largest trial of its kind in the world. It found that signal priority can be delivered dynamically based on the real-time status of the tram, road environment and signal phasing. This leads to a more efficient traffic signal operations potentially leading to increased capacity and movement of people.



Mobility for LIFE

The Victorian Department of Transport plans, builds and operates an integrated, sustainable and safe transport system to meet future transport demands and to power Victoria's economy. Our vision is to meet the aspirations of Victorians for a transport system that is simple, connected, accessible, reliable and safe, while supporting a productive, growing economy. The Victorian Department of Transport is also responsible for the management of freight, ports, boating and fisheries for commercial and recreational uses, maintaining Victoria's status as the freight and logistics capital of Australia.

From the 14–17 December 2021, Victoria will host the Global Public Transport Summit for the International Association of Public Transport (UITP) at the Melbourne Convention and Exhibition Centre. This Summit is the world's largest event dedicated to sustainable mobility.

Join international and local transport leaders as they delve into the future of mobility.

Now, more than ever, it is important we come together as a global industry to innovate and grow.

Visit uitpsummit.org for more information.

Uber MPTP Innovation Trial in Partnership with CPVV

Category

Intelligent Mobility

Submitting Organisation

Uber

Collaborating Partners

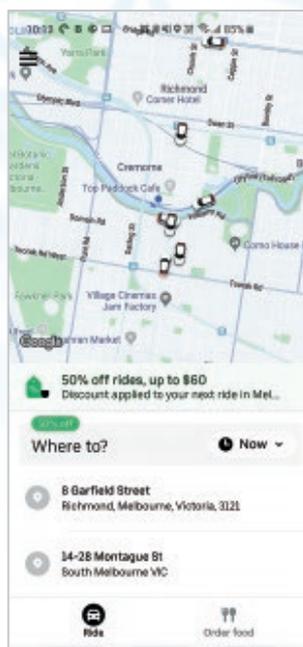
Commercial Passenger Vehicles Victoria

The Multi Purpose Taxi Scheme (MPTP) offered by CPVV assists with the travel needs of people with disabilities by offering subsidised taxi fares to its members. Traditionally, the MPTP has worked closely with taxis to provide transportation services. In 2020, Uber successfully conducted a pilot in Geelong under the scheme bringing more choice, lower costs, more reliability, better accessibility features to the MPTP's members.

Instead of using a government-issued charge card to pay for trips manually, Uber worked with CPVV to allow MPTP users to automatically have their trips subsidised on eligible Uber trips. A custom back-end process was also built for member validation and reporting. Safety is built into the experience through safety features in the app, strong community guidelines, and a specially trained support team. We were able to facilitate over 170 rides and earn a perfect rating from riders. Compared to the traditional offering, riders praised the new on-demand offering's ease of use, short wait times and seamless payment system.

In the long term, Uber will be integrated formally into the MPTP program statewide. Members will be able to take advantage of Uber's in-built accessibility features while enjoying an increased suite of mobility choices. The Victorian government will also benefit from greater spending efficiency given Uber's relatively low price compared to other providers.

The Uber platform is highly scalable, operating in over 900 cities globally. With the success in Geelong, CPVV and Uber now plan to launch on-demand for all MPTP members across Victoria in August 2020. Victoria has been a market leader in bringing innovation to state subsidised accessible transport programs. Uber is also in the process of working with other state transportation agencies across Australia and New Zealand to bring similar innovations to their accessible transport schemes.



C-ITS (V2X) Technology in Production Vehicles

Category

Connected and Automated Vehicle

Submitting Organisation

Cohda Wireless

Cohda's C-ITS technology features in over 60% of connected vehicle trials worldwide. The company is a partner-of-choice for OEMs and Tier One manufacturers, most recently Volkswagen. VW's new Golf 8 features the 'Car2X' solution which includes Cohda's standard V2X communication stacks, safety applications and NXP's RoadLINK® V2X solution, also supported by Cohda. This positions local technology at the forefront of the global shift to a being connected and intelligent.

The implementation of C-ITS will require the continued cooperation of governments, road and transport authorities, OEMs, and other organizations. With a C-ITS solution included in an iconic car brand such as the VW Golf 8 it is expected to accelerate the rollout of C-ITS technology defining a sustainable approach to its mainstream introduction.

This is the first large-scale automotive production deployment of C-ITS and is expected to surpass over one million vehicles in its first year. This development gives the entire C-ITS industry momentum due to the significant, wide scale investment made by VW on the back of its confidence in Cohda to deliver.

Cohda's C-ITS (V2X) software is built towards globally standardized protocols. With standardized messaging, vehicles deployed with C-ITS amongst diverse manufacturers can communicate with each other and enable safety and efficiency use cases such as transit signal priority and intersection collision warnings, all without line of sight. There is also growing interest to trial and adopt C-ITS communications in industrial and mining applications.

The prevalence of C-ITS technology in production vehicles encourages the rollout of corresponding smart city infrastructure which collectively defines a connected intelligent transport system. Cohda's C-ITS technology solutions are world-leading and enhanced by V2X-Locate, which allows sub-metre positioning accuracy even in urban canyons, underground car parks and tunnels where GNSS positioning is challenged.



Audit Specification for Infrastructure Readiness to Support Automated Driving

Category

Connected and Automated Vehicle

Submitting Organisation

Austrroads

Collaborating Partners

ARRB

Transoptim

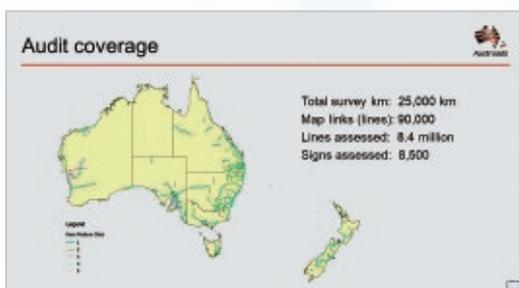
In October 2019 Austrroads published a new way to measure the readiness of road networks to support automated driving on freeways and highways using vision sensors and machine learning. The ability of physical and digital infrastructure to support automated driving will directly impact the scale and timing of the deployment of vehicles equipped with this life-saving technology.

The audit specification was applied to 25,000 km of Australian and New Zealand highways and freeways. This enabled a readiness score to be applied to over 8,000,000 individual road links. The approach dramatically cuts the cost and time for road operators wishing to measure the readiness of their networks to support advanced driver assistance systems and automated driving.

The audit specification covers line marking, traffic signs, route and lane discontinuities, temporary roadwork and incident conditions, cellular data coverage and the availability of map data. The data collected by the audit is available to road operators through ARRB's app. In addition, Austrroads is working on the development of an open data platform that will also make the data available to road owners and operators in the future.

While the audit specification was developed for Australasian roads, the potential to use the methodology internationally has already been recognised. In December 2019, Austrroads and ARRB attended a meeting of EuroRAP (European Road Assessment Program) to share the audit specification and the broader project that fostered its development. The specification has now been adopted by EuroRAP for a European Union demonstration project. The OECD's International Transport Federation has recognised the value of this research and in July 2020 Austrroads was invited to join the Working Group on Automation and also now sits on the Physical Infrastructure sub group.

Through Austrroads' participation in the OECD's working group on road readiness for automation, we expect other countries will also adopt the specification and audit methodologies.



NSW Smart Shuttle – Precinct Public Shuttle Service

Category

Connected and Automated Vehicle

Submitting Organisation

HMI Technologies

Collaborating Partners

Transport for NSW

NRMA

Sydney Olympic Park Authority

Keolis Downer

IAG

The NSW Smart Shuttle achieved several firsts in Australia and in the world, delivering both 'Connected' and 'Automated' innovations. It was the first known deployment of International Standards based V2I Connected Vehicle technologies to traverse through a signalised intersection completely autonomously in a live public road environment. It was also Australia's first precinct-based public shuttle service using multiple AV shuttle vehicles.

The use of an international standards based solution for interaction between AVs and signalised intersections means that this solution is relevant and applicable to any location anywhere.



Electric AV Shuttles will deliver an efficient, safe and sustainable first and last mile component of a transport ecosystem in the near future. This project aimed to progress towards this goal by demonstrating safe operation on public roads in a uncontrolled environment negotiating common tasks including left turn, right turn, stop sign, shared pedestrian zone, roundabouts, and signalised intersection. A project survey found that AV journeys met or surpassed expectations in 94% of participants. Transport for NSW used this project to help draft up the Automated Vehicle Safety Assurance framework which is now used in establishing further NSW AV trials.

The project worked with RMS to setup Road Side Units and the broadcasting of SPaT and MAP messages were generated correctly according the relevant ISO 19091 and SAE J2735 international standards. As part of supporting the live operations, the project worked with the road authority to establish a process to enable registering of AV vehicles. The project was also a catalyst for conversations with the State Insurance Regulatory Authority around insurance requirements for AVs.

The primary innovation was the implementation of International Standards based V2I Connected Vehicle technologies for interaction between an AV and signalised intersections. HMI Technologies initiated and led the delivery of this standards based solution and has paved the way for future projects to further develop AV shuttles as an effective transport component.

SAGE Automation AV Investment and Deployment

Category

Connected and Automated Vehicle

Submitting Organisation

SAGE Automation

SAGE Automation delivers and develops technologies that make integrated, smart and accessible transport systems of the future. This involves future-proofing road networks with the best Intelligent Transport Systems and communicative data technologies of today, and preparing for the onset of future technologies such as autonomous vehicles. With a foothold in the technologies and operations of trials, SAGE is able to bring all systems and stakeholders together, delivering a cohesive outcome.

SAGE Automation has invested and been involved in 7 AV trials with all major vendors in the market, across regional and city areas. This participation in trials funded by the South Australian Government, Future Mobility Lab Fund has enabled SAGE to measure sustainable benefits for the community, undertaking customer surveys and data analysis around AV patronage. The impact has been substantial as it has included a number of firsts. The 2-year Renmark Connect trial demonstrated the use of AVs in regional locations, with significant safety benefits achieved through the use of a smart traffic light system developed by SAGE.



To ensure autonomous vehicles are adopted more quickly across a range of markets, they need to be supported by connected infrastructure. SAGE has contributed to trials, demonstrating the importance of connected infrastructure. This inclusion creates a durable and long-lasting impact by making it easier for passengers and the community to engage with AVs.

The technology used in AV trials is transferrable, with pedestrian detection devices currently in use in McLaren Vale wineries, providing real-time data on tourist counts and dwell times for improved planning. SAGE provides university placement opportunities within AV projects for engineering students to develop key skills in the area.

Working with major AV vendors, SAGE have modelled an ecosystem demonstrating how AVs fit in an intelligent way, making transport more accessible and usable.



New Collaboration and Funding Models for Autonomous Vehicle Trials

Category

Connected and Automated Vehicle

Submitting Organisation

Keolis Downer

Collaborating Partners

Transport for NSW

City of Newcastle



The Newcastle autonomous vehicle project is a key part of the City of Newcastle's vision for a smart, integrated transport network. The aim of the project is to assess the role autonomous vehicles might play in multi modal transport systems.

The shuttle is operating on a public road providing a connection between the light rail and Nobby's Beach on the Newcastle foreshore within the integrated network. Not only is the project testing the safety aspects of operating on the road but also the appetite of customers to use the service as a true public transport connection. Bringing together Keolis Downer, local government and Transport for NSW, the trial will inform the design of multi-model transport models and how to driver efficiencies in networks design going forward.

More and more, actors outside of public transport authorities are becoming actively involved in public transport. As population and city density grows and infrastructure is more and more constrained cities, governments and private industry will have to come together to solve transport issues. This project is an example of a new collaboration that will become common place in the near future.



Once the concept of autonomous shuttles operating within a public transport network is proved, it can be replicated and scaled in many other jurisdictions.

The autonomous shuttle project is being delivered as part of the Newcastle City Council's (NCC) smart city strategy which aims to transform the city centre and suburban areas into hives of innovation and collaboration utilizing 21st-century technology. This makes the project unique as it is part of a wider technology ecosystem and will help inform the development parallel ITS systems.

The shuttle operates every day and creates a transport link for people travelling on the network.

Cooperative and Highly Automated Driving (CHAD) Public Experience – An Australian First

Category

Connected and Automated Vehicle

Submitting Organisation

Queensland University of Technology

Collaborating Partner

Department of Transport and Main Roads



Cooperative and automated vehicle technologies will change the way people travel. Through the Cooperative and Highly Automated Driving (CHAD) Experience, over 70 members of the public participated in a research program that measured their awareness prior, during and following an on-road demonstration in ZOE2 – Australia's first Level 4 Automated Vehicle.

Several technological improvements were implemented to achieve the robustness required to deliver this Australian first. Participants experienced two use case for AVs: 1) Robotaxi (a ride-hailing app) and 2) automated driving through live traffic (managing pedestrian crossings, roundabouts, and intersections) at a speed of up to 50km/h.

Participants were equipped with wearable devices (clickers, heart rate monitors) to gauge their perception of safety in an AV. Preliminary results demonstrated the valuable insights gained into safety perception, public acceptance of and trust in AV technology, with learnings to be implemented in all future community experiments.

The challenge was to deliver a safe on-road experience for the public, utilising existing infrastructure to enable ZOE2's operation through live traffic. Therefore, the technical team developed innovative decision-making processes to ensure ZOE2 could safely manage several critical road manoeuvres and navigate public car parks. A new HMI interface was also developed to enable the "driver" to reject the decision of the automated driving system, if needed. This improvement added another safety layer and made the journey smoother by removing unwanted stops related to driver's prior approvals.

The experience enabled the collection of valuable data relating not only to AV technology, but public perception and acceptance of that technology. This knowledge will inform further AV technology development, broaden our understanding of the profile of individuals most open to AVs, and provide important practical information for policymakers. Future public experiences of this project will continue to provide important feedback in the development of strategies to ensure the safe deployment of AVs in Australia.

Armidale Regional Driverless Initiative

Category

Connected and Automated Vehicle

Submitting Organisation

Armidale Regional Council

Collaborating Partners

Transport for NSW

EasyMile

TransDev Link

WSP

QBE

Edwards Coaches

University of New England

The Armidale Regional Driverless Initiative (ARDi) has seen a Level 4 fully-automated shuttle operating at University of New England and within Armidales' CBD. Regular services along a 5 km route made this the longest shuttle deployment in Australia. CBD deployment has proven the most advanced deployment of a CAV shuttle to date in Australia with ARDi travelling in a busy, mixed-traffic environment and navigating complex obstacles.

ARDi applies local electric vehicles as part of broader transport networks and in regional cities, with a third the CO2 emissions of ICE vehicles. The first-mile/last-mile services reduced student and shopper vehicle reliance, and the schedule was able to integrate with existing public transport, including a link to Transport for NSW's real-time passenger information. Congested CBD locations and student residences become more accessible for passengers without access to a private vehicle. The service provides a model for socially inclusive communities, with 90%+ passenger satisfaction recorded. Advanced 360-degree sensing, navigation and autonomous braking eliminates many of the risks associated with human drivers.

The learnings from this successful project template can inform local and state government planning. ARDi has given its partners the insight required to start to build towards a transport revolution now, modifying old systems for the best future efficiency and compatibility. Service timetables, passenger interaction methodologies, vehicle tracking, and supporting infrastructure have been analysed. Outcomes fed in to national regulations and updated guidelines with the National Transport Commission, and TAC's CAV framework.

ARDi's interactions with the residents, vehicles and infrastructure of Armidale can be scaled to almost any urban conurbation in Australia. These regional centres no longer risk missing the benefits driverless technology can bring to their communities. The model developed in Armidale is expandable within the city as well as for being replicable in similar environments around the country.



Renmark Connect 'Murray' Automated Vehicle Project

Category

Connected and Automated Vehicle

Submitting Organisation

Department for Infrastructure and Transport

Collaborating Partners

EasyMile

SAGE Automation

Renmark Paringa Council

Flinders University

Keolis Downer

Renmark Connect 'Murray' AV shuttle launched in August 2019, provides alternative community transport for Renmark's aged and mobility-challenged population, connecting residents to medical, social, and commercial destinations in the township. Phase 2 will include a focus on Renmark's tourism industry.

The social impact is significant, by providing a mobility option to reconnect aged residents with necessary medical and lifestyle facilities. Murray has a disability access ramp, maximising the utility for all residents. Operational safety was augmented by SAGE's smart traffic light system. Using a cellular V2I link, this ITS application enabled the trial route to cross traffic on a dual-carriage highway efficiently and safely. Geofenced zones activated the lights depending on Murray's position, allowing a two-stage, safety-gated crossing, delivering minimal interruption to traffic.

Renmark Connect is a 2-year trial and will showcase the use of AV technologies to deliver public transport to regional communities. Community engagement shows that first-mile last-mile services, once implemented, form a transport link for many demographics. The service will be enhanced with a focus on tourism and extended operating hours to include the weekend. The long-term benefits of this mode of transport will be evident when, environmental friendliness, and low-cost shared transport are made possible by autonomous technology when traditional modes of transport are not readily available in most regional communities.

The Murray transport model in Renmark is relevant for all Australian rural centres. The smart traffic signal system is vehicle-independent and transferrable to any platform to deliver safe, automatic traffic control via geofenced, scheduled or manual activation. The self-contained, solar-powered, 4G-connected units minimise installation requirements and provide monitoring and alerting capability for ultimate flexibility in application, including temporary and remote sites.



Impact of Connected Automated Vehicles: Licensing, Safety and Efficiency

Category

Connected and Automated Vehicle

Submitting Organisation

Research Centre for Integrated Transport Innovation, University of NSW

UNSW rCITI's CAV research and industry activities are aimed at pursuing world-leading interdisciplinary solutions for integrated transport planning and management, particularly centered around the benefits to society of automation, connectivity, digitization, and electrification of our transport network. These solutions help to address global challenges such as safety, congestion, vehicular emission, aging infrastructure, and rapid urbanization. Examples of our impact is evidenced by the successful Austroads guidelines on CAV licensing, project on traffic controls to optimize in an automated network, and our Future's Institute grant aimed at modelling and optimization of a Shared, Electrified and Automated Transport System.

rCITI's CAV research and industry activities are designed to be highly transferable ensuring the benefits have broader applications to achieve societal and global impact. Critical to the transferability of our work is our strategic partnerships with various research and industry partners (including Australian and international governments and policy makers, insurers and automotive OEM) through collaborative grants such as Linkage projects and iMOVE CRC projects. These organisations benefit from our foundational research that can then be adapted, enhanced, and applied for their own business needs: to shape better public policy, appraise insurance risk, and design user centred human-machine interfaces for CAV.

Our innovative research approaches allow us to create pioneering analytics and visualisation tools to better understand the impact of CAVs on travel behaviour and traffic flow. This prepares the groundwork for facilitating a smooth transition towards a CAV future.

UNSW rCITI's is a well-established, globally recognised research organisation in the CAV research. Our collaborative research as pointed out earlier has led to:

- Guidelines on licensing in CAVs.
- Evaluating insurance and safety impacts of CAVs.
- Development of novel algorithms and models to evaluate data integrity among CAVs.
- Efficient algorithms of traffic signals and parking strategies.
- Understanding behaviour and attitudes towards CAVs and shared mobility platforms using CAVs.



Multi-Modal Performance Reporting

Category

Transport Data

Submitting Organisation

Transport for NSW

Collaborating Partners

Agile Analytics

Data-Driven AI

Cubesys

Microsoft Australia

Transport for NSW generates significant amount of data from bus, ferry, light rail, metro and heavy rail modes every day. Multi-Modal Performance Reporting harnesses the power of data to improve customer services and manage the performance of operators. The vehicle journey and timetable data are shared through Open Data portal to enable self-service supporting Future Transport Strategy 2056.

Multi-Modal Performance Reporting provides transport operators and contract managers easy access to journey information at transit stop level to identify service availability and service interruption patterns; and identify areas of improvement where service targets are being missed resulting in degraded customer experience. Transport for NSW continuously receives request from public to share journey and timetable data. Due to volume of data and absence of appropriate technology, such requests could not be efficiently handled. Multi-Modal Performance Reporting provides ability to self-service such requests from Open Data portal.

Big Data and Data Science terms have become ubiquitous these days. Both internal and external stakeholders now expect Transport for NSW to provide journey and timetable data generated from all modes in near real-time for descriptive, predictive and prescriptive analytics. Using Azure Cloud and Big Data technologies, Multi-Modal Performance Reporting allows storage, transformation and self-service of this data to support decision-making on how customer experience can be improved.

Packets of vehicle position data received every 10-seconds are converted into journeys for descriptive, predictive and prescriptive analytics.

After successful proof of concepts in 2018 and 2019, the journey and timetable data for bus, ferry, light rail, heavy rail and metro modes is being stored on Microsoft Azure-based Operational Data Lake since July 2020 with dashboards shared with transport operators and contract managers for data-driven decision making and improving customer services. The historical journey and timetable data are being published through Open data portal to allow self-service by registered users thus providing a capability which did not exist prior to July 2020.



When to Travel Physical Capacity Indicator

Category

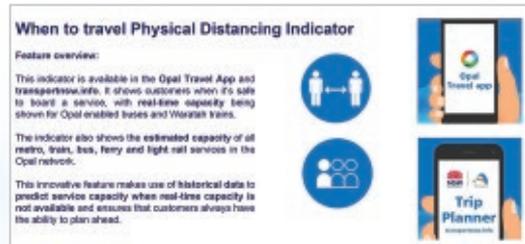
Transport Data

Submitting Organisation

Transport for NSW

Transport for NSW is helping customers make informed and safe travel decisions during COVID by providing information that aligns on-board capacity to physical distancing guidelines. Recent historical data is calculated to provide an estimation of expected capacity for all trains, buses, ferries, light rail and metro services. This estimated capacity is shown when real-time data is unavailable to provide customers with information they need to determine if travel is safe.

Capacity information is also useful beyond COVID to let customers decide when to travel for comfort, accessibility and night time safety. The impact of the Capacity Indicators has been swift and considerable. The team built the capability to adjust capacity rules within hours to reflect rule changes, eg. when bus capacity changed from 25% to 50%, customers had information needed within 2hrs.



We have already commenced using this technology and data in a new initiative to proactively alert customers to service capacity before they travel. Rather than asking the customer to search for the information directly, we provide it to them, based on their current travel patterns. We are also using this work to inform business and workplaces to encourage work from home or re-timing travel to ensure less crowding during peak periods.

While real-time information is available across most travel apps and station indicator boards, no other product provides the historical capacity information across all modes. The new estimated capacity indicator allows customers to plan ahead and see when a service is most likely to have available capacity on board, rather than arriving at their stop to find the service is full.

Faced with the reality of COVID, the need for our essential workers to get to work to support us all during this difficult period, and with public transport being the backbone of the city, the capacity indicator is perhaps one of our most important and impactful customer solutions.



The 30 Minute City: An Innovative Strategy and Analytics Platform to Drive Improved Public Transport Outcomes for Greater Sydney

Category

Transport Data

Submitting Organisations

Smash Delta & Transport for NSW

A product of the close co-design partnership between Transport for NSW and Smash Delta, the 30 Minute City platform facilitates a key measure of Future Transport 2056 vision of enabling access to work, retail, green space and other key services within 30 minutes of where you live.

The platform enables a new ability to both analyse and assess public transport services at a hyper-granular level. This level of understanding assists government as it continually evolves the planning and operation of the transport network by providing a measure of the vision of enabling residents of Greater Sydney to access work, commercial, retail and social areas within 30 minutes of where they live.

The platform was designed to enable maximum durability and usability. The innovative micro-modelling/optimisation approach enables geospatial abstractions of the city to easily be recomputed and readily re-aggregated to any region. In addition, the platform is durable to timetable changes and proposed / simulated future services. Furthermore, it is built as a foundation metric – enabling different lenses (active transport, accessibility etc) to be developed and applied to targeted use cases. This results in a platform that is 'future-proofed' and able to deliver lasting benefits for a range of government stakeholders.

With modular and adaptable assumptions – and a computational process built on cutting edge tech, open data and geospatial formats – the 30 Minute City capability is readily able to be augmented for a variety of applications and geographies.

The 30 Minute City platform has now been embedded within the Transport for NSW team to independently operate and has been successfully adopted as the transport performance methodology by the Greater Sydney Commission. This innovative way of understanding and assessing public transport access will continue to yield benefits for Sydneysiders as the city continues to build into the 21st century.



Innovation in Transport Network Analytics

Category

Transport Data

Submitting Organisation

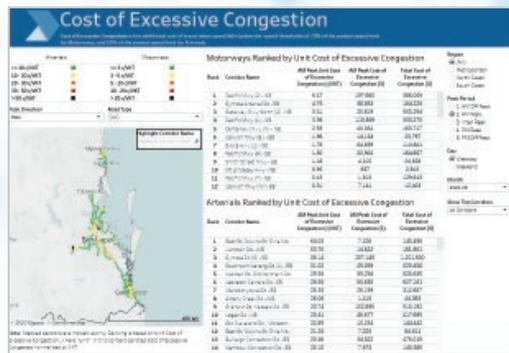
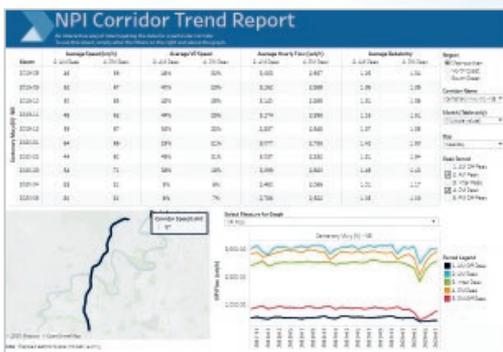
Department of Transport and Main Roads

The Department of Transport and Main Roads undertakes a broad range of transport network analytics activities, progressing transport analysis at a national level, and ensuring that TMR is well placed to understand the future of the transport network. These initiatives range from methodologies for calculating cost and causes of congestion, intelligent data blending, research into movement analytics and trajectory analysis, map matching, and various proofs of concept.

With a constant need to do more with less, it's critical that decisions and investments are based on meaningful and valid insights. Data is often an undervalued asset. The various methodologies and analysis approaches developed by TMR seek to derive more value from existing datasets, enabling improved insights and decision making. Ultimately this is about ensuring that the right decisions are made at the right time, based on the right information. Many of the challenges TMR seeks to overcome with these initiatives, such as Map Matching and Intelligent Hybrid, are challenges faced across Australian transport authorities.

Many of the methodologies and approaches developed by TMR are reusable across many different applications. This includes approaches to defining excessive congestion, calculating causes and costs, common calendars to understand baseline network conditions, approaches to defining network reliability, and rules for blending disparate data sources. These methodologies are shared and used across TMR, but also shared with other transport agencies who face the same data analysis challenges.

The various Transport Network Analytics initiatives with TMR seek to better use the data sources already available, and provide richer, more meaningful insights. This ranges from better understanding the reasons for congestion on the network, identifying bottlenecks and opportunities for improvement, through to seeking opportunities to influence real-time operational decisions through Movement Analytics and Trajectory Analysis. Other methodologies, such as the Intelligent Hybrid (for data fusion) are undergoing testing and refinement, with a plan to embed into systems.



Queensland Government — a leader in Intelligent Transport Systems

With over 50 years of innovation in transport technology, the Queensland Government's Department of Transport and Main Roads (TMR) is already a world leader in intelligent transport systems (ITS), and leading the way in cooperative, automated and electric vehicle technologies. Through innovation and technologies, TMR:

- supports an active and diverse ITS industry
- has a strong research and innovation agenda
- works in close collaboration with all levels of government, private sector bodies and research institutions to deliver integrated solutions while fostering harmonisation.

Queensland's success stories

The success of the transport industry is built on the full lifecycle of ITS innovation, development and deployment across multi-modal ITS, traveller products and services, vehicle connectivity, automation and electrification, and transport data analytics.

QLDTraffic



Smartship



MyTranslink app



Hold the red



Electric Superhighway



Emergency Vehicle Priority



Tomorrow's success stories

Mobility as a Service (MaaS)



Smart Ticketing



Cooperative and Automated Vehicle Initiative



Transport and Main Roads Transport Data Exchange

Category

Transport Data

Submitting Organisation

Department of Transport and Main Roads

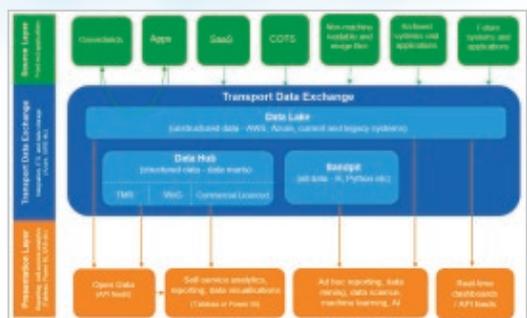
The Department of Transport and Main Roads has developed a strategic cloud analytics framework to unleash the full potential of its data to connect Queenslanders and create an integrated transport network accessible to everyone. The Transport Data Exchange (TDx) is helping break down data silos and store, organise and integrate TMR's vast quantities of data to enable analytics at scale, unlock new opportunities and enable more informed decision making.

Comprised of three environments—the Data Lake, Data Hub and Sandpit—the TDx empowers TMR teams to solve business problems, predict future trends and test the impact of decisions. It is designed with scalability and flexibility to adapt to and embrace new and emerging technologies as required.

TMR's approach to embedding the TDx goes beyond technology. It connects and shares organisational capabilities, platforms and procedures for translating data into actionable insights and sustainably building workforce capability. Each activity is delivered through partnerships between technical and business users, working together to identify needs, current capabilities and goals, then rapidly experimenting with technologies supporting the desired outcomes. Simultaneously, capability is transferred and business users are upskilled to lead delivery of future solutions.

The TDx is the first of its kind in the Queensland public sector – providing a framework for a single, centralised source of truth that democratises TMR's data.

To date, 95 TDx initiatives have been delivered, enabling over 500 days' worth of resource savings and more than \$350,000 in technology savings. Application of the TDx framework has empowered TMR business areas to solve 45 business problems (such as image processing of roadside assets using machine learning); enabled three strategic roadmaps; increased business intelligence tool utilisation by 700% and enabled multiple external data exchange solutions. The TDx framework is being applied as part of TMR's Cooperative and Automated Vehicle Initiative, to ensure data generated and captured by the network is discoverable and democratised.



Data-Driven Analytics and Simulation Platform for V/Line Performance

Category

Transport Data

Submitting Organisation

Data Science Institute,
University of Technology Sydney

Collaborating Partner

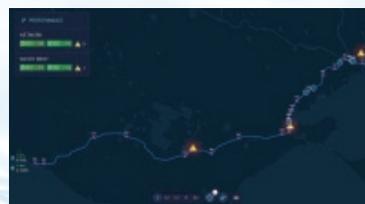
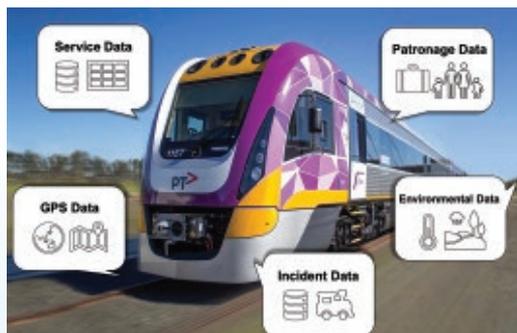
V/Line

In this project we have created a novel data-driven platform to provide performance analytics to V/Line train network by integrating machine learning and simulation components, as well as updating suggestions in cloud service with massive computational capability.

Targeting train punctuality and reliability improvement, UTS and V/Line bring together massive data to operational optimization. We further bring and integrate impactful modern digital technologies, including machine learning, data mining, and simulation, to reveal actionable insights for operators such as delay/cancellation risk and reason, incident impact on punctuality, and incident response plan in terms of dwell time extension.

The system provides continuous benefits by running a cloud-based service to supply updated suggestions with any environmental changes. The suggestions include the forecasts for recent or long-term future.

We create a generalizable standard framework for modelling train performance, including metrics quantification, the process of analytics and simulation for traditional data and IoT data, and cloud-based APIs to provide environmental data support. All these make the system transplantation easy. The data-driven naturally makes our system expandable, into other train



operators, other states/countries, or even other public transport systems such as airlines and bus when delay and cancellation are major concerns.

It is the first attempt to handle multi-source big data including IoT data, patronage data, service data, traffic control signal data, incident data and environmental data for train punctuality and reliability improvement. To activate the data, we developed innovative computing technologies by integrating machine learning and simulation technologies. Some of the innovative ITS functions include evaluating environmental impacts, such as incident, animal activities, and weather. These impacts are combined with network impacts, such as dwelling, scheduling, and train status. Especially, we create a digital twin system for focused areas, such as the Geelong line, the busiest line.

The insights can improve situation-awareness of delay/cancellation and support decision making on incident response.

Evolution of the National Telematics Framework to Meet New Demands for Road Network Utilisation Data

Category

Transport Data

Submitting Organisation

Transport Certification Australia

Collaborating Partner

Transport for NSW

TCA has introduced new applications, features and services through the National Telematics Framework to meet the evolving needs of infrastructure managers and heavy vehicle regulators to manage networks through digital technologies and data. The Transport for NSW operational policy for heavy vehicle telematics leverages new applications and features of the Framework to improve insights of vehicle movements on its road network, underpin new productivity reforms, and advance safety and asset management outcomes.

There are immediate direct benefits to:

Heavy vehicle operators

- Removal of paper-based permits to monitor the operation of OverSize OverMass vehicles.
- A 21.5% increase in the payload of construction vehicles operating through Sydney, Newcastle and Wollongong.
- The aggregation of vehicle-generated data from Dangerous Goods vehicles.

Transport for NSW and local governments in NSW

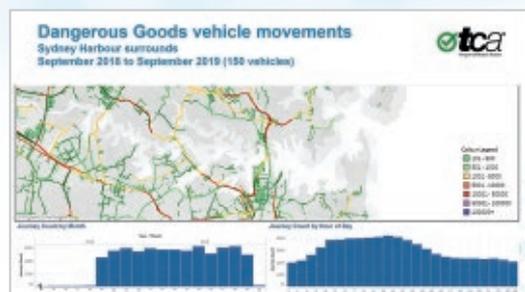
- Improved visibility of heavy vehicle movements.
- Reports and map-based visualisations are being rolled-out to 300 local governments across NSW through the Telematics Analytics Platform.

The developments to the Framework build upon a recognised and stable platform, comprising stakeholder agreements, data dictionary, data exchange protocols, technical and functional standards, and cost-recovery models.

The Framework supports contemporary assurance approaches, with new levels of assurance for technologies and data, which are outcome-focused and aligned with evolving stakeholder needs. It is more technology agnostic, and now supports a wider range of telematics systems from automotive manufacturers and operators.

The evolved Framework has already enabled data reporting on vehicle types and movements not previously monitored, including oversize/overmass, dangerous goods and container movements.

The Framework developments have been designed to be transferrable to other vehicle categories and applications in future, and enables data ingestion from a range of sources. These include connected light vehicles, live monitoring of vehicle movements, road user charging, automated driving systems, etc.



Machine Learning and Deep Learning Applied to Automatic Vehicle Identification

Category

Transport Data

Submitting Organisation

SICE

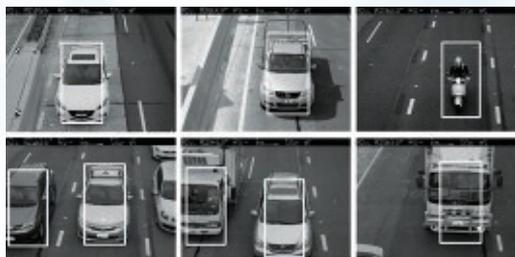
The Advanced Automatic Vehicle Identification (AAVI) module, part of SICE's Tolling Operational System (TOS), is a module that substantially improves the tolling system's automatic vehicle identification capabilities by using Machine Learning and Deep Learning technologies. This module has been successfully deployed in a brownfield tolling system and has vastly improved the system's automation rates and efficiency, significantly minimising operator involvement and saving costs.

The AAVI has greatly improved the TOS automation rates, allowing the operators to reduce the time dedicated to Licence Plate Identification and thus increasing the system's efficiency. This new implementation of machine learning capabilities into tolling systems opens many possibilities of applying the same technologies in other aspects of the sector and potentially further improve the involved systems and increase their efficiency.

Machine Learning and Deep Learning Technologies increase their impact the longer the period they are implemented, as they continuously fine-tune their capabilities by learning from experience and processing the information they receive. For this reason, the AAVI will have lasting benefits on tolling systems as the module will continuously increase its automation rates.

The system includes two different fingerprinting engines, one using Machine Learning technology and the other one using Deep Learning technology, to match the image taken by the tolling system with previously-stored transaction images. The image then goes through a Detector that is "trained" by the engines to detect vehicles using a classifier algorithm.

As a system that uses Machine Learning and Deep Learning, its results will gradually increase during its initial months after implementation. After the first month, we saw, as expected, that the automation rate was growing continuously. In 8 months, the AAVI's performance increased from the initial 86% to almost 96% of automation, positioning the solution as one of the best options in the market, proving the benefits of implementing "learning" systems in the ITS sector.



Automated and Predictive IoT-Based Water Pump Operational and Asset Condition Dashboard

Category

Transport Data

Submitting Organisation

Transurban

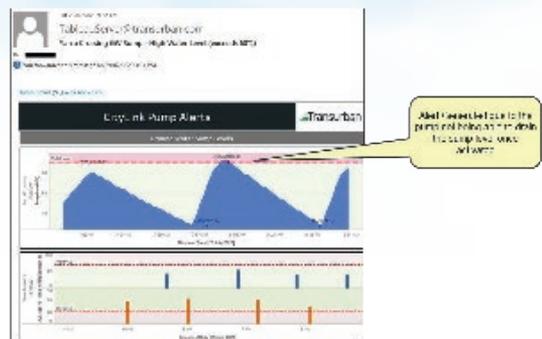
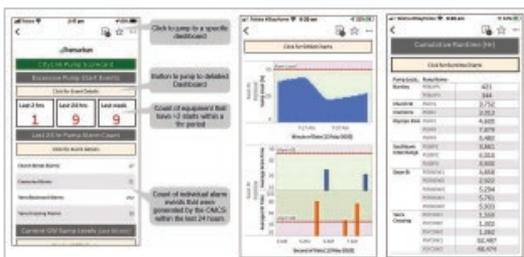
By using the vast amount of data collected through smart IoT sensors, Transurban were able to build an automated, predictive and mobile solution to optimise the maintenance of water pumps operating 65 metres underground. Transurban have reduced the need for potentially dangerous manual and labour-intensive assessment and maintenance tasks and reduced maintenance costs through predictive condition alerting.

The safety benefit achieved by the solution is the significant reduction in the need for maintenance staff to physically inspect and manually record water pump activity. This process is now not only automated, but with the data married to the predictive capabilities built into the solution, Transurban are now alerted in advance of potential issues that would impact the operation of the water pumps and consequently impact the reliability of the road network and our customers journey.

The solution is expected to extend the life of equipment as it will alert maintenance staff to issues before they become potentially catastrophic. For example, the solution will monitor the performance of a water pump by calculating its ability to move volumes of water. If this performance is below a threshold, then alerting will guide maintenance staff to inspect equipment before it causes permanent problems.

The solution was built to be re-useable and Transurban are currently implementing the solution across the many roads that utilise water pumps within its network. Transurban is currently looking to apply this model to the jet and exhaust fans used to control tunnel emissions.

The solution brings together a number of different complex data sources generated by IoT sensors and collected in near real-time. The alerting and mobility of the solution ensures that ITS staff can be alerted to potential issues without being in the office. The solution also provides an analytical aspect that allows staff to look at more long-term trends to assist lifecycle management of the assets.



Quicker, safer, more reliable

While you're thinking about getting home on time today, we're making sure you do—quickly and safely. Behind the scenes, we're also working on ways to get you home 10 to 20 years from now.



NorthConnex, Sydney, opening 2020:

750 CCTV cameras | 24/7 automatic incident detection | 140 jet fans
1,200km cables, including heat sensitive fibre optic | 5,500 LED lights

Lane Compliance Analytics Tool to Optimise Roadside Safety and Influence Lane Closure Strategies During Roadside Incidence

Category

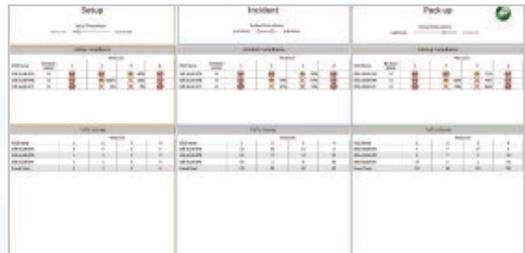
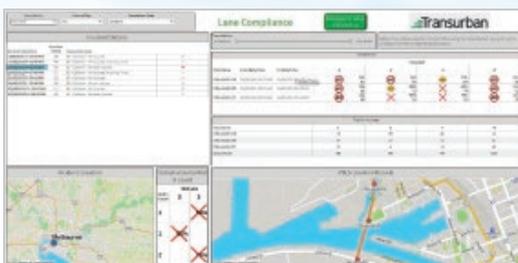
Transport Data

Submitting Organisation

Transurban

Transurban have used its vast amounts of IoT data from various roadside devices and combined it into a single analytical tool that enables Transurban to determine the optimal lane closure strategy to make its roads a safer place for both drivers and support staff.

The analytical tool allows Transurban to look at different types of roadside incidents (eg. planned maintenance, collisions, breakdowns) and decide on the optimal lane closure strategy to ensure drivers and staff operate in the safest possible environment. Transurban research has shown that during incident response events, up to 60% of vehicles had not merged out of the closed lane by the 1st Red X and up to 45% had still not merged out by the 2nd Red X.



The data collated over many years and with the use of modern database technologies, is now providing insights that were previously unimaginable. Transurban are now gaining insights into driver behaviours that were previous based on observations and instinct rather than evidence. These insights will continue to inform the way Transurban operate its roads and help maintain its impeccable safety record.

Driver behaviour rarely varies whether it be a toll road, a freeway or a general-purpose road. Questions like, "Is it better to have 2 or 3 merge lane signs prior to a Red X sign on a 4 lane road at 2pm" can now be answered easily with fact based evidence. The Lane Compliance analytical tool allows Transurban to answer these sorts of questions within seconds.

The Lane Compliance analytical tool brings several enormous and disparate datasets together into a single solution. Apart from the performance challenges that big data solutions often exhibit, the overwhelming challenge in developing this solution was to find ways of relating datasets that had no natural data relationship and bring them together.

Deep Mobility Data Platforms – Towards a Cost Efficient Approach to Understanding Mobility

Category

Transport Data

Submitting Organisation

Research Centre for Integrated Transport
Innovation, University of NSW

Our smart parking projects in Sydney and Adelaide integrated data from sensors, CCTV, traffic counters, and people's choices into a unique unified platform to assess on-street, off-street and shared parking policies. We introduced ITS-enabled surveying tools to study preferences of people for electric vehicles (sustainable), autonomous vehicles (safe), on-demand transport (efficient), and active mobility options (health). We disseminate the transport data to public through our online dashboards.

We clean, cure, process, merge, integrate and analyse data to be then used in models extracting the most out of the deeply hidden layers of information in multimodal data sources. Our data-driven models are updated upon the arrival of new data. We are dedicated to real-time data collection and model updating endeavour, facilitated by advanced statistical and machine learning techniques. We have pioneered the use of crowdsourced data. Our passive app-based data collection tools make the data collection less cumbersome for participants, and less costly for clients.



Our smart parking project introduced a tool to bring together different sources of data to monitor, manage and plan parking in NSW and SA. Emerging mobility options such as EVs, AVs, CAVs, and MaaS are studied in rCITI by borrowing concepts from discrete choice modelling, theory of innovation diffusion, machine learning and optimisation methods to deliver insights about technologies of the future.

Our models and methods are not only approved and published in the most prestigious journals, they are also being used in the field for designing parking in Australia, managing traffic in India and Indonesia. Among our surveying tools, e-mission has been tested several times in the real world. It also has a community of users/deployers who actively maintain and contribute to its development, which warrants its longevity. Our land-use and COVID surveying platforms and dashboards have been adopted by other researchers in Chicago for data collection purposes.

CANdrive Automated Vehicle Program

Category

Research and Development

Submitting Organisation

Seeing Machines

Collaborating Partners

ACT Government
The University of Newcastle
University of Canberra
Transport Industry Skills Centre

The CANdrive program provided the evidence base to support the introduction of automated vehicles onto our roads in ways that are safe and that promote greater mobility and independence for the community. The findings show that driver monitoring systems are a critical technology to keeping drivers safe. CANdrive is an ACT Government sponsored program, using Seeing Machines' driver monitoring technology, to understand how drivers will interact with automated vehicles.

Through our global partnerships with automotive OEMs and Tier 1 suppliers our driving monitoring technology, informed by the CANdrive findings, is fitted to new vehicles around the world from late 2020. Further, as a member of the Occupant Status Monitoring Working Group of EuroNCAP, Seeing Machines is helping to translate these findings directly into policy that will provide the stimulus for European OEMs to introduce driving monitoring technology into their vehicles.



Level 2 automated vehicles, such as the Tesla Autopilot feature, are available for sale in Australia. There is however no deep understanding about how drivers may interact with these systems and how safety may be impacted. In a world-first we studied drivers while they became distracted using the Tesla Autopilot feature, capturing their visual attention (where they were looking) using our driving monitoring technology. We showed that drivers trust automated vehicles very quickly and engage in long duration distracting tasks (including phone use) while the vehicle was in automated mode. This knowledge has informed both safety policy and safety technology.

The camera-based driver monitoring system that was developed and refined during this program has already been sourced by a number of automotive OEMs around the world. The insights are also directly shaping safety protocols internationally through the EuroNCAP Occupant Status Monitoring working group that will shape safety protocols in Japan and Australia - providing incentives for automotive OEMs to employ DMS by awarding greater safety points. Lastly, the findings are also being used by the ACT Government and National Transport Commission to shape road safety and mobility policy to promote the safe introduction of Level 2 automated vehicles to our roads.



Transport Talk Customer Research

Category

Research and Development

Submitting Organisation

Department of Transport and Main Roads



Transport Talk, TMR's online customer research panel and customer community community (with a membership of 4000 strong), allows our customers the opportunity to have their voice heard through meaningful and engaging surveys, discussion forums and face-to-face focus groups and interviews. It informs customer-centric business decisions across the department and provides a best practice model integrating the voice of the customer into Australian ITS through in-person and virtual activities.

Transport Talk is part of an integrated suite of customer research and design capabilities that TMR uses to support the delivery of benefits to government, business and the end-user customer in the short, medium and longer term. Insights from these activities are shared across TMR to ensure benefits are realised across transport domains, including ITS-related infrastructure, service design, and service delivery.

While the predominant focus of activities to date has been on gathering the voice of end-user customers, the approach can also be applied to gathering the voice of government and industry partners to support the seamless design and delivery of ITS enabled solutions.

While online customer communities are not new or innovative in themselves, Transport Talk is innovative in its application of the customer insights it delivers and the relationships it builds, where every research study is aligned to one or more of TMR's strategic objectives. Separating TMR from commercial entities is the requirement for public transparency and accountability. Whatever the future holds as technology changes, we know our customers have been part of the conversation from the beginning and are co-designing a safe and productive transport future with us.

The activities undertaken through Transport Talk are supported by a benefits realisation framework and rigorous methodologies to provide a strong evidence-base for understanding and anticipating customer responses to ITS supported technology.

Research Study – How Automated Vehicles will Interact with Road Infrastructure Now and in the Future

Category

Research and Development

Submitting Organisation

Department of Transport and Main Roads

Collaborating Partners

Queensland University of Technology
iMOVE Australia

Working together, a joint government and university team was able for the first time to open the black box of autonomous vehicle AI technologies. Training these technologies specifically for Australian roads and conditions revealed key insights into how well they would interact with local infrastructure. Another first was the creation of high definition mapping technology and the demonstration of its crucial role for autonomous vehicles in an Australian context.

Australian transport agencies have rapidly mobilised to investigate and understand the implications of future transformative mobility technologies like autonomous vehicles, but have primarily studied commercially available technologies in mostly 'black-box' manner – with limited visibility of the underlying operation of these systems. This project developed current state-of-the-art systems specifically for Australian conditions, providing deeper and more future-proof insights into the likely deployment scenarios, including the role of future infrastructure changes and high definition maps. This work has made significant progress in empowering Australian transport agencies to best position themselves for future mobility opportunities.

Transport departments across Australia are seeking to prepare their physical infrastructure for automated vehicles, including any required asset investment decisions. However, making significant investment decisions to support technology which is rapidly evolving is challenging. Therefore, this research investigated the current and likely future technology capabilities rather than just focusing on currently available vehicles. The research investigated how the identified technological shortcomings could be mitigated through infrastructure improvements and high definition mapping technologies. These insights, achieved through an unprecedented level of technical investigation, provide a much more holistic view to the decision makers before significant investment decisions are made.

This project was the first in Australia to develop, deploy and train these systems specifically for Australian conditions, leveraging significant local world class machine learning expertise including at the Queensland University of Technology's Australian Centre for Robotic Vision.



Transit Assignment Engine: The Agent-based Simulation Engine Enriched with Disease Spread Model

Category

Research and Development

Submitting Organisation

Data61 CSIRO

Collaborating Partner

Transport for NSW

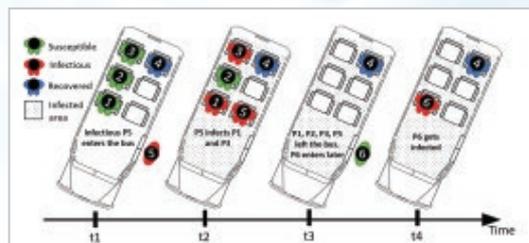
CSIRO teamed up with Transport for NSW to develop a Traffic Assignment Engine with a Disease Spread Model (TAE+SEIR) for in-depth analysis of virus spread patterns in transit networks and the impact of non-pharmaceutical mitigation measures. It combines transit assignment, agent-based microscopic simulation model, and a single point disease spread model mimicking the infectious disease spread between passengers allowing to identify hotspots and spread patterns to support strategic and operational decision making.

It is yet to be fully understood how virus such as COVID-19 would spread in public transport networks. Generic and agnostic to transport networks, TAE+SEIR allows to build a digital twin of the Sydney public transportation network, providing a holistic view of its performance and the dynamics of a contagious disease spread. It has the potential to model various diseases and mitigation scenarios. It provides statistics, data analytics and visualisation-based insights toward supporting transport agencies in both strategic and operational decision-making regarding management strategies relieving the impacts of infectious disease spread in transit networks to improve safety.

TAE+SEIR is a fast-performing, highly efficient software with a user friendly interface. Its open architecture allows for integration of complementary datasets to enhance the level of detail and modelling accuracy of various diseases, preventative measures and policies and can be used to represent any multi-modal transit network from any city.

TAE+SEIR traffic assignment engine enriched with a disease spread model is the world-first and first of its kind in Australia. It provides a base for modelling of various intervention scenarios to inform strategic and operational response planning with the aim to diminish the negative impact.

The outcomes supported timely decision making around introduction of effective cleaning regimes. Yielded results identified hotspots and infection clusters. TAE+SEIR is currently used in an investigation of the impact of wearing facemasks and patronage limitations. The disease spread parameters and datasets are continually being updated as new information about COVID-19 becomes available.



Sydney Mobility as a Service (MaaS) Trial with Accompanying App, 'Tripi'.

Category

Research and Development

Submitting Organisation

IAG

Collaborating Partners

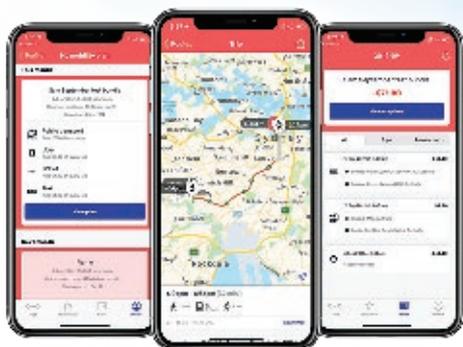
ITLS (University of Sydney)

SkedGo



The Sydney Mobility as a Service (MaaS) trial undertaken by IAG, Australia's largest general insurer, ITLS (University of Sydney), mobility app developer SkedGo and iMOVE Australia has advanced the understanding of the role that MaaS can play in improving a travellers' experience of using multiple complementary transport services. The trial tested real-world travel subscription plans (using cost, travel time, convenience, health benefits and perceived safety) and studied impacts to traveller behaviour and experience.

The Sydney MaaS trial is truly innovative and the first its type in Australia, by exploring alternatives to reliance on private vehicles, and the disruption to mobility services that are now possible through emerging technology.



The trial goes further than other schemes in Europe and the Nordics, establishing how different bundles of mode mixes affect MaaS uptake and travel behaviour in a live setting. The transparent nature of this trial ensures that lessons learnt are disseminated to a broad audience, paving the way for future dialog on commercial prospects of MaaS.

The Sydney trial has demonstrated that there is local commuter interest in MaaS, and that it is possible to develop a MaaS product that includes a number of subscription plans as well as pay-as-you go which appeal to different segments of the travelling public, resulting in changes to their travel behaviour.

The Tripi app delivers a more convenient way of making travel choices and accessing mobility bundles, offers centralised payment and rewards sustainable travel behaviour. A major feature, which distinguishes this trial from others, is the suite of subscription bundles, as each was tested to ensure they are market relevant and complementary. The trial has been able to validate all of the key components of a MaaS delivery program in a live Australian setting, of which a digital platform is only 1 element and will cement Australian leadership in the MaaS field.

Improve Train Network Operation Performance via Machine Learning Techniques

Category

Research and Development

Submitting Organisation

Data Science Institute, University of Technology Sydney

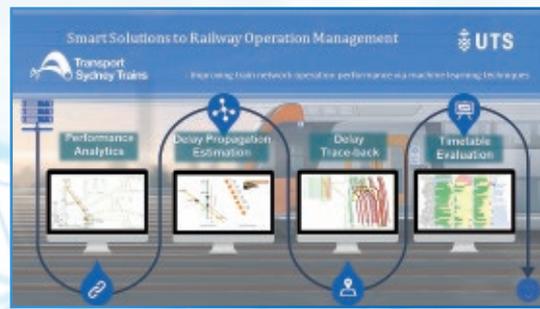
Collaborating Partner

Sydney Trains

UTS and Sydney Trains have successfully applied advanced machine learning techniques to develop a timetable robustness evaluation model. The model can assess timetables and response plans to ensure that that timetables/response plans are operationally robust and resilient. The outcome of this application of the intelligent timetable evaluation technology significantly reduces delay-caused losses and increases the operation efficiency, enables the train operating system to meet performance metrics and recover from incidents.

It provides the world-class data-driven analytics methods with multidimensional solutions applied state-of-the-art deep learning techniques. It has been validated nationwide through datasets gathered from several train operation corporations. Based on the statistics, improving the On-time running rate by 1% can potentially save customer lost minute value by AU\$5M.

This work shows train operating companies that they can produce highly detailed and granular information to develop targeted timetable design and real-time scheduling strategies. The proposed model is a generic model that can be easily applied to other traffic scenes with subtle refinements.



This impact of the solutions goes beyond Sydney Trains. We have been working with Victoria train operation corporations at the same time. Amongst the collaborations with the partners, the team has access over 4,000 kilometres of rail track used by passengers and freight rail operators with more than 13 million passenger journeys per week.

This is the first data-driven model that can provide detailed station-level, line-level, and network-level analysis and evaluation results, and can real-time predict the delay effect after capturing delays. Importantly for rail managers and controllers, end-to-end timetable evaluation and delay prediction is automated achieved by data-driven techniques. This eliminates the need for domain expertise and hard-core feature extraction.

Smart Parking and Community Services Platform

Category

Research and Development

Submitting Organisation

RMIT University

Collaborating Partner

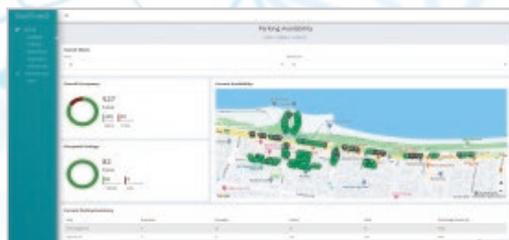
Mornington Peninsula Shire

The Smart Parking and Community Services platform uses smart technologies to guide improved council services and the liveability of busy towns. Tourists and visitors will be able to plan trips more effectively based on their individual needs, consequently ensuring economic stimulus to regions. Social benefits are also feasible with special users, for example, users who need to locate convenient disabled parking bay that minimizes walking distances and total trip time.

Our product significantly reduces the workload of council officers while improving the efficiency and confidence of their planning and decision-making processes since it can forecast future scenarios allowing them to plan ahead of peak demand. Local residents and visitors can interact with our system to access parking and routing information. Through this project, we reduced the hunting time for parking down from, on average from 4.14 minutes to 1.41 minutes. This beats most of the other trials we are aware of. One trial in San Francisco only reduced hunting time by 43%. We dropped it in Feb-March 2020 by 61%.

Currently, the system has been installed around Rye, a popular tourist spot of Mornington Peninsula Shire in Victoria, Australia. Since our system is capable of handling any number of amenities, it can be adapted in other cities around the globe where there is a high demand for parking and amenities such as the towns with high tourist attractions.

The core of our solution includes advanced AI, big data, and IoT techniques to integrate different types of sensors from different vendors to work together as a seamless platform. Our system consists of a cloud-based data portal and sensor data management platform, a map-based visualization dashboard for municipal services, and an open data API.



Download our whitepaper
at www.kapsch.net/ktc

Imagine a World without Congestion.

Mobility of the future.

kapsch >>>
challenging limits

Kapsch TrafficCom

Join us for our 'Congestion Webinar' through ITS Australia on Tuesday 1st December at 3:30 pm AEST with David Bolt (VP Sales & Solution Consulting - APAC) & Aritza Eneko Aldama (Global Product Manager) for a LIVE demonstration of our urban traffic management product, **EcoTrafIX**.

>>> www.kapsch.net

The Kapsch Smart Intersection within the AIMES Mobility Hub

Category

Research and Development

Submitting Organisation

Kapsch TrafficCom Australia

Collaborating Partner

The University of Melbourne

The Kapsch 'Smart Intersection' overall purpose is to put a spotlight on reducing congestion and increasing roadside safety through changing driver behaviour within yellowbox zoned urban intersections using the latest in Automatic Number Plate Recognition, video analytics and deep learning technology to influence. Our focus is both a modular and scalable system that has a variety of use-cases including yellowbox detection, protected turn, erratic driving, bus lane enforcement and performance measure based analytics.

Approximately one third (32%) of deaths and 44% of serious injuries on Victoria's roads occur at intersections. Therefore, our focus of the Kapsch Smart-Intersection has key themes around improving road user safety, congestion and enforcement 'themes' to help change and influence road user behaviour. Since the system's early deployment, over an average daily passage, over 15 erratic driver based incidents have been detected (avgday) including solid line lane changing and tailgating through to vehicles blocking the lanes that have a green light to move.

Traffic operators in TMCs will benefit first from the innovative platform as well as enforcement agencies and local councils. Future scaling out the solution for use by state Government agencies to collect statistical data to influence better road user behaviour through better awareness and enforcement of erratic driving behavior to preempting incidents at an intersection are key focus areas ahead.

The system has been built to be agnostic and with open RESTful output APIs built-in, the ability to integrate to existing operator platforms has been front of mind. From here, through increased vehicle insights from the intersection, the objective is to improve the situational awareness on our roads to traffic operators to make better, more informed decisions to react to unplanned incidents or peak traffic demand build up and to be able to measure the impact of these changes in the network at critical intersections and corridors.



Compass IOT Digital Transport Management Platform

Category

Research and Development

Submitting Organisation

Compass IOT

Compass IOT is a data aggregation transport management platform. We ingest traffic speed and volume data for public and private vehicles. Our platform aims to reduce the timeframes and financial costs associated with current traffic data collection methods, such as manual counts and hardware-reliant counts, used in city planning. The value for users is traffic data for sections of road, across Australia, instantly.

There are significant impacts for city and transport planning, and safety. Compass is also developing a safety-mapping tool, measuring g-force and hard-braking in line with the Safe Systems approach. Researchers found speed-related trauma relies upon anecdotal evidence and that speed is underreported due to extensive crash reconstruction being hard to conduct without data. Compass aims to use connected vehicle data to provide quantitative evidence and improve safety.



Because Compass is a digital software, it is easily applied to different locations, states, or countries. There is no need to install new hardware as it utilises existing installations and other data through connected vehicles. Files created in the platform have been designed to be downloadable, shareable, and uploadable by any account holder across organisations. Thus, it fosters an ecosystem between traffic consultants, councils, and government organisations and allows for better cross-organisational quantitative information transfer.

Our input datasets are in the form of trip traces that include Vehicle ID, speed, heading, location, timestamp, trip ID, acceleration x-y-z axis, and other sensory data. Control datasets are fixed or variable counts conducted across hundreds of sites to determine coverage and verify accuracy. Instead of merely providing raw data, users have more autonomy over the time and dates they select, the number of roads they survey at once, and the ability to share a visual dashboard output or download raw counts.

Video Content Analytics (VCA) for Automated Traffic Surveys

Category

Research and Development

Submitting Organisation

The University of Western Australia

Collaborating Partner

Main Roads Western Australia

The Video Content Analytics software is a potential game changer for traffic surveys. It replaces conventional imprecise and laborious manual surveys with state-of-the-art technologies that can automatically extract traffic engineering data from footage with significantly higher quality and quantity. Better data leads to better modelling, which leads to better intersection and road design, and more efficient use of government investment.

Road designers rely on traffic models to predict the performance of their designs but models can only be as good as the data. Although many sophisticated modelling packages are available, the lack of quality data has been the shaky foundation since conventional traffic surveys rely on imprecise and laborious manual counting.

Main Roads has committed two further research projects using the data generated by the software to improve roundabout modelling and design.

Our technology can be deployed across Australia. We are also confident it can be deployed overseas since we had to overcome some challenging conditions in Australia, eg. we have stricter aviation regulations than many other countries. Drones' flight height and proximity to traffic are both tightly constrained so we often have to shoot videos at low angles that cause vehicles to be occluded by other vehicles or natural obstacles. Many other commercial providers can only process videos with high angles. Other challenges include Australia's large trucks, strong wind that causes the drone to drift and harsh light casting strong shadows.

Our solution is only possible because of the latest technological development in drones, machine learning, and computer hardware. Most commercial providers can only collect simple data (counts, speed, and flow) and require stricter operating conditions. Our program extracts much more statistics including delay, gap analysis, queue length, back-of-queue arrival, origin-destination data, etc according to Australian guidelines. The richer data can help make better use of government investment and design safer roads.



Using In-Ground Sensor Data to Understand Parking Behaviour and Adjust Controls

Category

Research and Development

Submitting Organisation

PBA Transit Planning

Collaborating Partners

City of Yarra

City of Melbourne

The innovation is to use data gathered for enforcement to reveal parking behaviours. This information enables evidence-based adjustment of parking controls so that fees are 'as low as possible but as high as necessary' to avoid time lost in hunting for an empty bay and to maximise the number of people who can reach the area.

Many councils collect data bay-by-bay, 24/7 from in-ground parking sensors. Past sensor data is not used to inform compliance evaluation or planning. PBA Transit Planning compiled millions of data points to prepare shareable visualisations for the Cities of Yarra and Melbourne opening a path to evidence-based world's best parking management practice avoiding additional capital expense or costly and limited manual data collection.

All councils with in-ground sensors can mine sensor data to maximise parking space productivity. Regular, data-informed adjustments to controls (tightening and loosening) can be introduced. In areas without meters, adjustments can be made to the span of hours and length of stay. Meter tariffs and fees can be adjusted to avoid 'under prescribing' or 'over dosing'. Data will show when fees need to be introduced. Data-informed compliance programs will ensure resources are used effectively to achieve measurable changes in behaviour.



The innovation is to use 'discarded enforcement data' to reveal parking behaviours, eg. initially to address trader anxiety about meter fees in Bridge Road, Richmond, Melbourne. Millions of data points were compiled to reveal measures such as arrivals, length of stay and availability of bays. Two rounds of adjustments were made to fees, meter hours, and span of controls. Subsequently, arrivals increased, optimum availability was retained and people stayed longer in the centre.

The barrier to its use is conceptual: many councils see parking as a revenue-generating system. The alternative is to see parking fees and penalties as tools that influence behaviour. Councils that understand parking controls as a means of influencing behaviour so that parking productivity is optimised will consider this approach.

TN360 by Teletrac Navman

Category

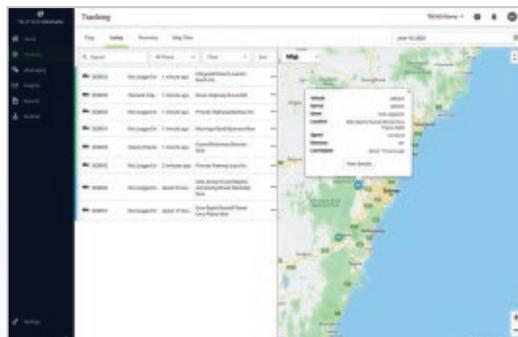
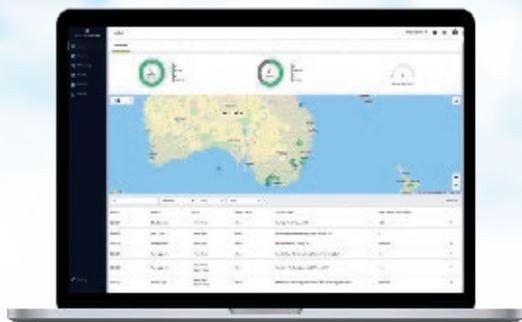
Research and Development

Submitting Organisation

Teletrac Navman

TN360 is one of the first Australian telematics platforms powered by artificial intelligence (AI), delivering personalised insights based on company data and learning from businesses so they can make powerful decisions instantly.

As businesses employ more IoT and Edge devices collecting mass amounts of data, we wanted to create a platform with an AI-first mentality. TN360 will significantly impact Australia's transport and trucking industry by delivering personalised insights based on company data, learning from businesses so they can make powerful decisions without sifting through spreadsheets. As we move to higher bandwidths and more connected assets, TN360 is one of few platforms catering for big data creation growth, allowing businesses to understand and apply it for greater efficiency.



TN360's first users will be Australian businesses in the trucking, transport and logistics sectors, to match the speed of their business growth. Our in-vehicle technology is designed to meet modern business requirements, and TN360 will create opportunities in mining, construction, local government and other general fleets, such as corporate or utilities. One ongoing opportunity for TN360 is the ability to connect and integrate with pre-existing business solutions to create an all-in-one, comprehensive platform, while predictive guided search will deliver actionable insights.

TN360's Drone View allows construction and mining businesses to direct machinery to a precise location. Similarly, Live View offers real-time camera footage of a vehicle alongside a map of the asset's second-by-second movements.

Unlike other systems, TN360's AI-driven design moves businesses from historical viewpoints to predictive viewpoints, enabling them to anticipate trends, behaviours and anomalies through company data. Designed and developed primarily in Melbourne, TN360 incorporates natural language search, visual analytics, drone view and various tracking lenses or views of the data, enabling businesses to drive change and increase productivity.

A Participatory Prioritisation Tool for Cycling Investment in Sydney, Australia

Category

Research and Development

Submitting Organisation

City Analytics Lab, University of NSW

Collaborating Partner

Expanded Perception and Interaction Centre,
University of NSW

This Sydney study created a digital tool that integrates citizen feedback directly into how emerging data and ITS are used to inform investment in active transport infrastructure. By combining passive data traces with active citizen feedback, the tool demonstrates how we can marry public participation and advanced data analytics – two fields which are rarely paired. This approach is increasingly important as we now realise the benefits of active transport.

The rethinking how citizens engage with big data, often generated by their own movements, is used in the transport industry is incredibly important. This research attempts to challenge the traditional notions of participation and how we can combine both active and passive data generated by citizens apps and transport sensors into actionable insights by local/state/federal governments that can be used to prioritise active transport infrastructure.

Following a survey of 15 experts, community members, advocates, consultants, government employees evaluating the tool – the key target group for using this was local councils as well as transport planners. By combining many data layers into an interactive interface, and composite / changeable index, the tool allows these planners a better way to explore, deliberate prioritise cycling infrastructure in their local area and present those results to experts and stakeholders representing other travel modes.

This approach is highly transferrable and leverages on big data and created models from several disparate sources – active citizen surveys (comments), citizen surveys (spatial), Strava data modelled to cycleway counters, a cycling commuter demand model, a road safety model, a gradient/slope model, transit accessibility model, propensity to cycle model (latent demand), separated cycleways and dangling nodes. As well as this it includes a costing module, and a comment-matching system showing relevant citizen comments for particular areas.



Smart Mobility Systems – A Cost Effective Approach to Monitor and Manage Transport

Category

Research and Development

Submitting Organisation

Research Centre for Integrated Transport Innovation, University of NSW

The University of NSW rCITI has developed a report identifying education and training requirements for drivers of light and heavy vehicles equipped with SAE Level 0 to 2 Advanced Driver Assistance Systems, and Level 3 Automated Driving Features. The outcomes determined whether licensing requirements in Australia and New Zealand should change to ensure drivers have the necessary education and training to safely operate these technologies on the road network. The project has significant impact on the safety of the transport systems.

We have used Chatswood CBD as a living laboratory promoting effective use of data, creating an open data hub portal where fragmented data from multiple stakeholders are brought together, analysed and visualised offering meaningful insights to all users. The open data hub portal will continue operating as a powerful data sharing tool beyond the project duration, encouraging activity from residents and visitors.

rCITI has developed a set of analysis and modelling tools to evaluate the effectiveness of different smart parking policies that are transferable to other locations and councils. The tools inform and enable city authorities to develop effective parking regulations and to identify and develop opportunities related to shared parking.

We have developed analytics and visualisation tools to better understand and improve the environmental performance of the city (eg. traffic noise and urban green canopy) using emerging crowd-sourced and mobile phone-based data.

We have further produced a suite of well developed technologies ranging from modelling tools to crowd-sourced traffic signal systems, these include crowdsourced traffic signal controllers developed at a 10th of the cost of conventional traffic signal control systems, and a multi-modal virtual reality system, known as TRACSLab, as the world's largest and only system that integrates cycling, pedestrian and vehicle simulators.



Contemporary Parking Policy, Practice and Outcomes in Three Large Australian Cities

Category

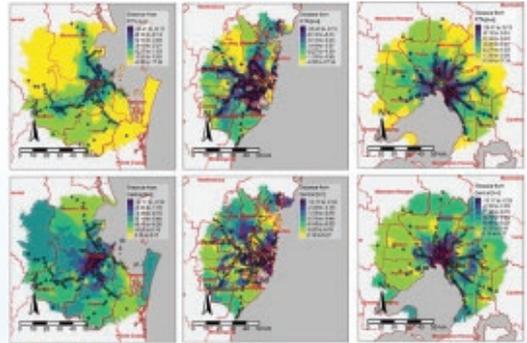
Research and Development

Submitting Organisation

University of Queensland

Collaborating Partner

Department of Transport and Main Roads



The Progress in Planning monograph entitled “Contemporary parking policy, practice, and outcomes in three large Australian cities” conveys the key findings from a research collaboration between the University of Queensland, government, and industry entitled “Reclaiming Lost Ground: Transitions of Mobility and Parking”. The key findings are impactful for land use and transport planning by demonstrating how parking influences modal choices and consequently, the demand for road capacity and public transport.

Once our monograph is printed, we anticipate that it will impact Australian land use and transport planning by demonstrating how parking influences modal choices throughout the metropolitan areas of Brisbane, Sydney and Melbourne and consequently, the demand for road capacity and public transport. Further, the study reveals how weak policy coordination between local planning agencies and state transport authorities hinders the transition away from automobility and toward more sustainable transport.

This impact is expected to have longevity/ durability given that the study provides the most current and comprehensive examination of parking policy, parking supply and modal choice in Brisbane, Sydney and Melbourne. Additionally, it provides a broad synthesis of land use and transport planning theory.

The findings are transferable to many metropolitan areas given that rather than a single case study, we have examined and contrasted within and between Australia's three largest cities to ensure our findings have external validity. Further, our template analysis is scalable given that parking policies are already commonplace throughout the cities in Global North and increasingly in the Global South.

The monograph represents multiple innovative research contributions. A comparative framework of urban mobility organised by planning orientation, approach and intended modal choice, which we developed to explain how and why parking policy is changing throughout the three metropolitan areas. The use of Geographically Weighted Regression (GWR) to explain why particular suburbs in three metropolitan areas have a greater inclination toward active and public transport.



ITS Australia iMOVE Projects

Projects at ITS Australia

ITS Australia, in partnership with our members, works to design relevant and effective research projects to support a range of transport industry activities and goals. At ITS Australia, we build relationships, advocate for industry, and engage with government to inform and advise.

In 2020, ITS Australia completed two significant research projects.

Connectivity in C-ITS

Investigating pathways to accelerate the uptake of road safety and efficiency technologies

The Cooperative Intelligent Transport Systems (C-ITS) combine information technology and mobile communication to enable data and command transmissions between vehicles, roadside infrastructure and a central management systems, in order to improve roadway safety for all users, as well as traffic flow efficiency in the network.

There is a potential to increase the number of compatible connected vehicles within the Australian fleet over the next decade through the fitting of after-market devices and/or increasing the demand of consumers for connectivity to be enabled in new vehicles arriving in Australia.

ITS Australia, in partnership with iMOVE Australia, delivered an exhaustive literature review and undertook interviews and workshops with key stakeholders nationally and internationally and analysed responses. Following an assessment of case studies and existing applications of technologies in a range of use cases an investigation of Victorian road accident data identified a number of findings that could improve safety outcomes for our communities both in urban and regional environments.

Unlocking Shared Mobility

Investigating free-flow parking for car-share in Australia

Across Australia, there is increasingly intense competition for kerbside space and parking. Roadside infrastructure management is a complex challenge in most jurisdictions so working to better understand and improve current parking arrangements will tackle a range of high priority issues for local and state governments, businesses, and our growing urban and regional centres.

Free-floating car sharing services (FFCS) have been introduced in a range of jurisdictions internationally as an additional option to round trip car-sharing. FFCS removes the need for the shared vehicle to have a specific parking spot, most commonly allocated by a Local Government Authority (LGA), negotiated with the car-share provider. FFCS allows users to pick up and return cars anywhere within specified areas of a city.

Unlocking Shared Mobility is made possible with funding from partners through iMOVE Australia on behalf of the Australian federal government. Project partners are: ITS Australia, RMIT, IAG, Cubic Transportation Systems, and Royal Automobile Association of SA.

To read more about these projects, and all of ITS Australia's work, please visit www.its-australia.com.au



Young Professional Nominees

Nominees for the ITS Australia 2020 Young Professional Award for demonstrating passion and dedication to the ITS industry as a young professional.

Abdulmalik Alyousfi

Bachelor of Electrical Engineering (Honours),
Graduate ITS Engineer, QLD ITS Engineering –
Transurban

Alex Bowler

Project Delivery Manager, New Mobilities –
Keolis Downer

Amirtha Chidambara Raj

Bachelor of Science (Engineering Science),
Master of Professional Engineering (Civil),
Graduate Engineer, Transport Technologies –
Arcadis

Azadeh Emami

PhD student, Department of Infrastructure
Engineering – The University of Melbourne

Jackson Meyer

Founder / Global CEO, Owner – Verus Global

Jessica Tong

Graduate Transport Engineer and Research
Assistant – WSP and The University of Melbourne

Lee Summerville

IT Programmer – Q-Free Australia

Michael Holme

Director – Conigital

Shashank Kumar Gupta

Doctoral Researcher, Electrical and Computer
Engineering – The University of Newcastle

Thomas Van Nguyen

Control Systems Engineer – Kapsch TrafficCom
Australia

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17th Asia Pacific Forum on Intelligent Transport Systems

Brisbane Convention & Exhibition Centre
Queensland, Australia | 12-15 April 2021

ITS Innovation Creating Liveable Communities



In April 2021, the four-day forum will connect transport technology professionals from across the Asia Pacific region. Featuring a hybrid—in-person and digital—program, you can join the 17th ITS Asia Pacific Forum wherever you are in the world.

The forum theme, “ITS Innovation Creating Liveable Communities”, will demonstrate Australia’s new initiatives and adapted learnings from the advances of our neighbouring megacities. Key topics to be covered include MaaS, Automated Vehicles, Data Analytics, Transport Inclusivity, and Network Development.

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The ITS Australia National Awards are a celebration of excellence in the Australian Intelligent Transport Systems industry and are hosted annually by ITS Australia.

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