



Transport Academic Partnership

2019–2020 Annual Report

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Message from TAP Steering Group Chair



Julie Mitchell

Deputy Director General (Policy, Planning and Investment), Department of Transport and Main Roads

As Deputy Director-General of Policy, Planning and Investment Division, and Chair of the TAP Steering Group, I am pleased to see the TAP partnership continuing to facilitate strong relationships between TMR, MAIC and the academic sector. Collaborative and innovative R&D is key to supporting and informing our role in developing strategies, policies and investment planning for an integrated, safe and efficient transport system for all Queenslanders.

While 2020 has certainly been a period of significant challenges as a result of COVID-19, I am proud of the fact we have continued to progress the full range of opportunities provided through TAP. It's also been great to see how well we've managed and worked together throughout this difficult time and how we've kept TMR, MAIC and our academic partners connected by adopting new and innovative technologies and changing our ways of working.

Looking ahead, I am reminded of how important higher education, science, technology, research and development are to our quality of life, to the strength of our economy, to our security and to progressing our strategic transport agenda.

Thank you to our TAP university partners for another 12 months of hard work and dedication to delivering better transport outcomes for the people of Queensland. I look forward to collaborating with you to deliver more great outcomes, through the new TAP Agreement 2020-25.

Transport Academic Partnership Transport Chair Messages



Professor Alexander Paz,
Transport and Main Road's Chair

QUT has had a very successful and fulfilling year working with multiple people across TMR, Motor Accident Insurance Commission (MAIC), Griffith and the University of Queensland (UQ).

We completed research projects involving traffic operations, traffic safety, active transport, and traveller behaviour. We continue delivering models, algorithms, analytics and recommendations which can be used to make operational and planning decisions to improve the overall performance of Queensland's transport network.

The Transport Academic Partnership (TAP) agreement has attracted additional resources to QUT, including a new agreement with the Brisbane City Council (BCC), who funded the Transport Innovation Research Hub (TIRH), and a new research grant from the Commonwealth Department of Infrastructure, Transport, Regional Development and Communications, to improve traffic safety practice in Australia. We will continue to look for leveraging opportunities provided by the TAP agreement and deliver the best possible research outcomes for our partners. We look



Griffith University



Associate Professor Matthew Burke,
Cities Research Institute

Griffith's transport research team has had a difficult year with the COVID-19 lockdowns affecting many of our projects. Transport PhD work placements in TMR teams have had to cease for the time being.

Despite this, projects on cashless fare payments, value capture funding and financing, demand responsive transit, market segmentation for transport models, and pop-up bike lanes have all progressed well. But perhaps this year's largest achievement was BCC funding the TIRH, modelled on the TAP agreement, with the three TAP universities.

The new agreement allows us to pursue projects that are of mutual interest to TMR, MAIC and BCC. It should produce collaborations across universities, agencies and transport systems, for the benefit of those who rely on those transport networks.



The University of Queensland



Professor Mark Hickman,
Chair of Transport Engineering

We believe our transport research and expertise at the University of Queensland (UQ) can support better solutions and outcomes to the long-term challenges in Queensland.

Through collaboration, the TAP program has made it possible for researchers at UQ to make significant strides in understanding the safety of Queensland's existing road network, the dynamic patterns of movement among public transport passengers and road vehicles in south-east Queensland, the needs and possible solutions for better mobility among older Queenslanders and the challenges of a future world of connected and automated vehicles.

About us

The Transport Academic Partnership Agreement

The **Transport Academic Partnership (TAP)** 2015-2020, is a \$3.3 million agreement between the **Department of Transport and Main Roads (TMR)**, in partnership with the **Motor Accident Insurance Commission (MAIC)**, **Griffith University (Griffith)**, **Queensland University of Technology (QUT)**, and the **University of Queensland (UQ)**.

The TAP Agreement enables the partners to undertake strategic transport Research and Development (R&D) projects and build transport capability within the university sector, TMR, MAIC, and industry to address future transport challenges in Queensland. The TAP Agreement establishes collaborative and cooperative arrangements between the parties to deliver research, learning and development outcomes.

In addition to the funding provided, the TAP Agreement outlines the objectives of the partnership as well as setting out required performance indicators and reporting arrangements. The R&D outcomes are intended to deliver on the agencies' strategic priorities and provide support for the broader Queensland Government innovation priorities.



Transport Academic Partnership Objectives



Foster a collaborative partnership and strong alliance between government, industry and the academic sector

Fund and enable transport related research and development activities that deliver positive outcomes for the transport system and the Queensland community

Build transport research excellence and capability in Queensland



Performance Snapshot

The success of TAP is measured against 10 key performance indicators as outlined in Schedule 2 of the Agreement. The performance indicators are reported against by the university TAP Transport Chairs at the end of each financial year.

Objective 1

Build transport research excellence, innovation and capability in Queensland.	
Performance Indicator	2019–20 Performance
Academic staff at Griffith’s Urban Research Program, QUT’s Transport Research Group and UQ’s Centre for Transport Strategy.	Above satisfactory
Higher-degree research students (PhD, Masters by Research and Honours Research) undertaking transport related research at the universities and synopses of study areas.	Above satisfactory
University students, undertaking transport related research or studying transport related subjects, who have gained work experience, placement or internships within agencies or other organisations in the transport sector, if known.	Satisfactory*
Transport-related continuing professional development courses/programs offered to agencies by universities.	Needs improvement
Transport-related workshops, seminars and technology transfer activities delivered by Universities that are relevant to Agencies’ priorities.	Above satisfactory*

Objective 2

Foster a collaborative partnership and strong alliance between government, industry and the academic sector.	
Performance Indicator	2019–20 Performance
Activities where Chairs/post-docs/ associated staff have worked on joint collaborative R&D initiatives with government, industry and/or the academic sector, undertaking the Annual Work Program, including in-kind support.	Above satisfactory
Organisations involved in collaborations that value add to the partnership.	Satisfactory

Above satisfactory	≥ 10% improvement since 2018–19
Satisfactory	≥ 5% – ≤ 10% improvement since 2018–19
Needs improvement	≤ 5% improvement since 2018–19

Objective 3

Fund and enable transport related Research and Development activities that deliver positive outcomes for the transport system and the Queensland community.	
Performance Indicator	2019–20 Performance
Universities demonstrate that they have matched Program Funding provided by agencies through in-kind contributions and funds leveraging, including list of projects and associated funds receiving leveraged funding.	Above satisfactory
Transport-related outputs (such as research papers, advice, peer review,) delivered by the universities (and provided to agencies) on issues that: <ul style="list-style-type: none"> ➤ have direct relevance to agency business needs and research priorities, and/or ➤ have clear policy outcomes and/or ➤ have practical application which can be implemented by agencies and/or ➤ can demonstrate transport innovation (e.g. proof of concept projects). 	Above satisfactory
R&D activities delivered by the universities are completed within agreed timeframe and budget.	Needs improvement

* Assessment rating adjusted due to the impact of COVID-19.

Objective 1: Build transport research excellence, innovation and capability in Queensland

The performance measures for this objective are intended to quantitatively capture the number of transport-related academic staff and students and development opportunities created and/or delivered by the University Partners. A major objective of the Agreement is to ensure that major Queensland universities maintain relevance and continued progress within the transport research and development field.

Progress in 2019–20

Measuring the number of academic staff working in each university partner’s transport areas helps demonstrate how the TAP Agreement fosters transport research capability in the academic sector. From 2018-19 to 2019-20 the number of employed transport-related staff at the universities grew by 6.4 per cent, which is a total 21.7 per cent growth over the life of the 2015-2020 TAP Agreement. This growth can be attributed to the introduction of new technologies in the transport field and governments and industries’ support for R&D.

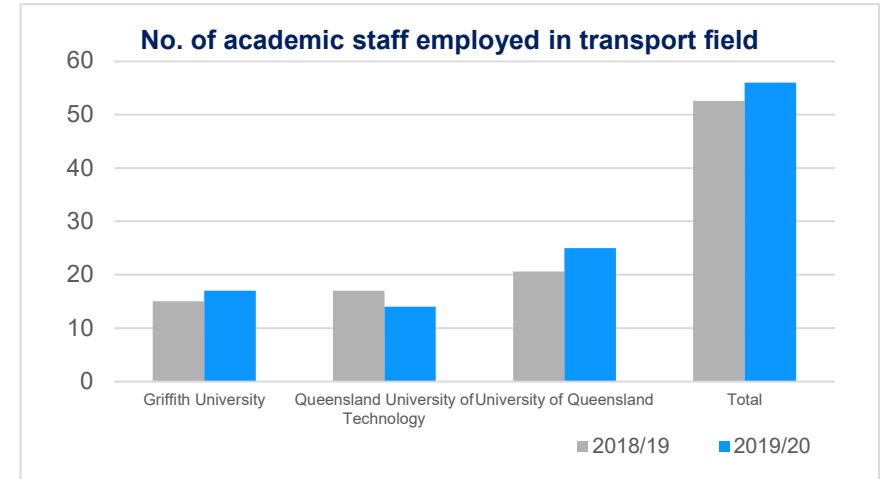
The number of higher-degree students undertaking transport-related research is a positive indicator of the influence of the TAP Agreement on transport research innovation. This indicator has shown steady growth across the years of the TAP Agreement with a 47.4 per cent increase in numbers since 2015. This year has seen a 16 per cent rise in growth to match the 16 per cent rise from 2017-18 to 2018-19. The university partners have attributed this to the many diverse careers becoming available in this sector.

Key performance indicator 3 has been found difficult to measure due to an inability to accurately capture data due to privacy restrictions. As such, this measure will be discontinued in its current form. In the new Agreement, the university partners, however, may report on student placements.

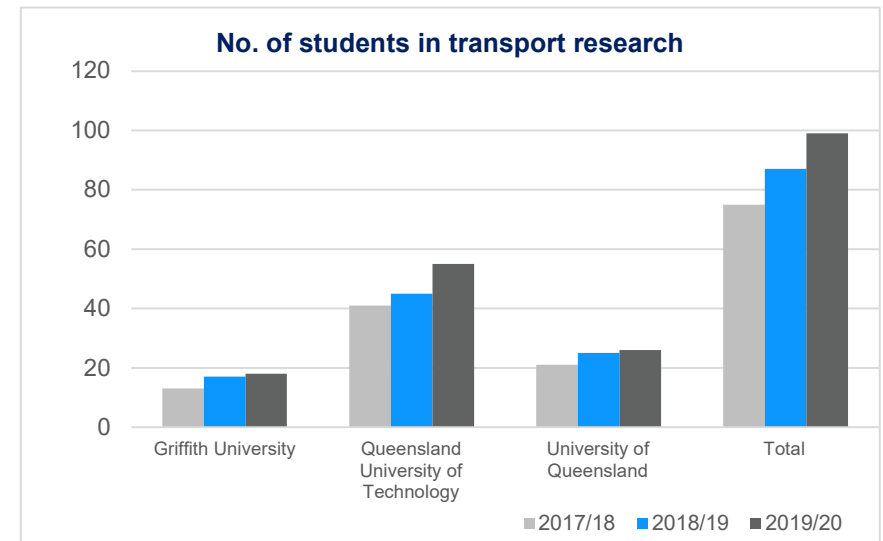
The number of transport-related professional development courses or programs offered to agencies by the university partners has continued to decline since the start of the TAP Agreement. There was a 75 per cent decline between 2017-18 to 2018-19, followed by a 2 per cent decline in 2019-20. Some of this can be attributed to changing delivery approaches, including more online delivery. This criterion will not be measured in the new TAP Agreement 2020-25.

Transport-related workshops and seminars delivered by university partners contribute to building transport research excellence and capability in the transport sector. COVID-19 has had a significant impact on the second half of the 2019-20 program year. However, several events were held before restrictions were imposed that indicated the university partners were on track to perform well in this criterion.

Performance Indicator 1 demonstrates a 3.5 per cent increase in the number of academic staff employed in the transport-related university faculties.



Performance Indicator 2 demonstrates the increase in the number of students undertaking transport-related research at the universities.



Objective 2: Foster a collaborative partnership and strong alliance between government, industry and the academic sector

The performance measures for this objective are intended to demonstrate the influence of the Agreement on improved collaboration between allied agencies and organisations. TAP is structured as a partnership, which encourages open communication and strong relationships between partners.

Progress in 2019–20

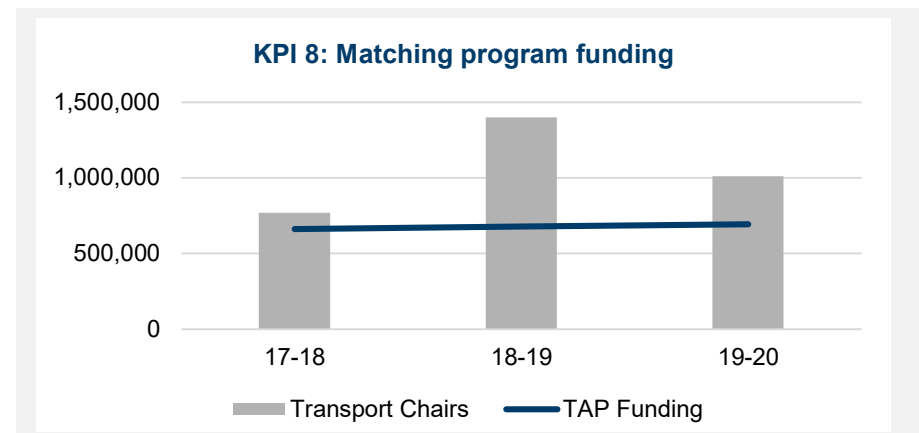
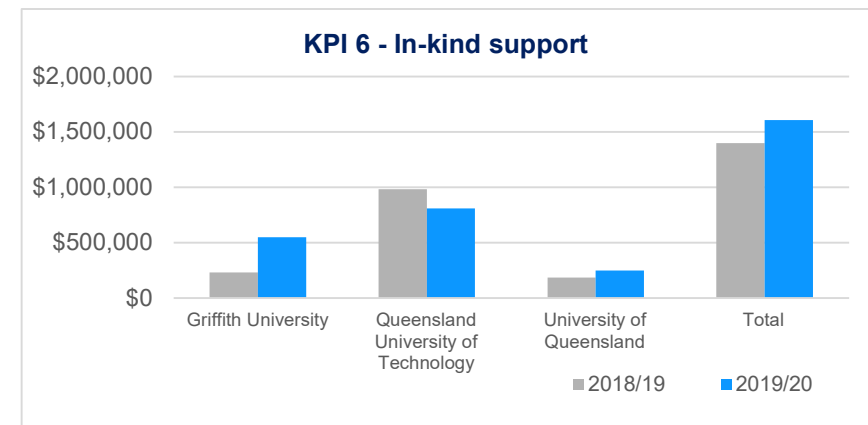
The number of collaborative R&D activities being undertaken by university partners has consistently increased since the commencement of the TAP Agreement, with a total of 53 activities undertaken in the 2019-20 financial year. This represents a small increase of four new activities, and more than double the number of activities, undertaken in the first year of the partnership.

Collaborative activities include the new Transport Research and Innovation Hub, work on Urban Water Transport Systems and the delivery of the TAP annual work program, in-kind support on transport-related research projects, and membership on transport-related boards and committees. The university partners have formed strong relationships with industry (iMove), government (BCC) and other research groups (Australia Research Council) actively seeking out and competing for transport related funding.

Collaborating organisations include; local governments, state government agencies, cooperative research centres, other Australian and international universities, industry, advocacy groups, and advisory bodies. Over the past two years there has been an increase in the amount of leveraged funding being secured by the university partners. This long-term funding enables universities to recruit and retain highly qualified academics with ongoing specialisations in undertaking transport research in Queensland.

COVID-19 had a significant impact on the second half of the 2019-20 financial year. However, the TAP university partners have collectively contributed \$1.6M worth of in-kind contributions and leveraged funding to the delivery of the TAP Agreement objectives and work program projects.

This exceeds the annual allocation of funding paid to the partners under the Agreement for 2019-20 (total of \$694,990 incl. GST). The expenditure is an increase of more than \$207,000, from the 2018-19 period of \$1,398,809.



Objective 3: Fund and enable transport related research and development activities that deliver positive outcomes for the transport system and the Queensland community

The performance measures for this objective are intended to demonstrate the value of the research and development activities delivered through the Agreement, including capacity of universities to leverage other funding sources and the number of outputs delivered.

Progress in 2019–20

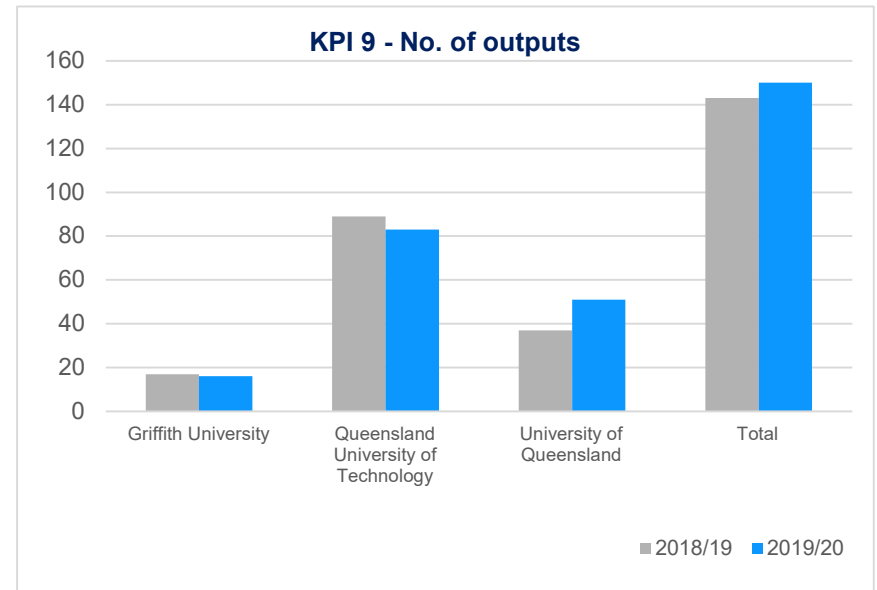
Transport-related outputs from the university partners in 2019-20 showed a small increase from 143 in 2018-19 to 150 in 2019-20. Outputs included research reports, journal articles, conference papers, and journal peer reviews.

Six projects were completed in 2019-20, with a further ten being carried over to the 2020-21 work program. Of the 10 carry-over projects, half have experienced some delays due to COVID-19, or through other unforeseen issues. These projects will be rescoped and in one instance the project has been undertaken by another university partner.

Key performance indicator 10 is difficult to quantitatively assess due to the complex nature of R&D project delivery and the project life not matching the end of financial year reporting cycle.

One project from the 2019-20 annual work program has since been discontinued, two projects were not started in the period due to staff movements, and the unavailability of a key researcher and COVID-19 caused delays with three projects. Two projects have also since been rescoped by the TMR business area and university partners.

Key Performance Indicator 9 demonstrates a small increase in the number of transport related outputs produced through the TAP Agreement since 2018–19.



The North Brisbane Bikeway

Project lead: Cycling and Walking Team, Policy, Planning and Investment Division, TMR

Partner: Griffith University

This evaluation has found that the North Brisbane Bikeway (NBB) is a very effective and active transport corridor between Bowen Hills and Woolloowin. The bikeway is being delivered in stages by TMR, in partnership with BCC. Stages 1A and 1B have been delivered. Construction of Stage 2 and 3 began in June 2019 and were delivered in late 2019. Stages 4 and 5 are expected to be delivered by early 2021.

Once all stages are completed, the bikeway will provide a physically separated cycleway and pedestrian link along a corridor which is currently only ridden by very experienced and disciplined riders.

Once connected to Kedron Brook Bikeway and routes north through to Chermside, this facility will complete a major missing link in Brisbane's arterial bikeway network. As an all ages and abilities facility, it is expected to generate significant growth in bicycle commuting from Brisbane's northern suburbs.



Providing age friendly transport services for Queensland

Project lead: TransLink

Partner: QUT

This project used data gathered from a demographic which is currently under-represented in available transport behaviour datasets. An online survey of more than 600 people aged between 65–75, was undertaken between November 2018 and January 2019. The survey was distributed by TMR, the Department of Communities, Disability Services and Seniors (DCDSS), the Council of Aging (COTA) and several regional councils.

The initial findings suggest that when older people stop driving and/or rely on public transport, significantly fewer social trips are made. It also found that non-drivers were significantly less likely to own a smartphone. The next phase of the project is conducting focus groups across the state to gain a better understanding of challenges faced by this demographic in rural and regional areas.



2019–20 Work Program

University Partners work with TMR business areas to undertake and deliver an annual Work Program of research and development projects.

In 2019–20, twenty projects were undertaken by the TAP university partners, six projects were completed in the 2019-2020 financial year and one project was discontinued.

Thirteen projects are ongoing and eleven are to be completed as part of the 2020–21 Work Program. The remaining projects* (2) were completed in July 2020 prior to the initiation of the new TAP Agreement 2020-2025 and the development of the 2020-21 Annual Work Program.

TAP projects can include:

- projects that meet agencies' strategic priorities
- trial projects such as proof of concept or pilot projects
- joint projects with other universities; and/or industry partners and other ad-hoc/emerging issues
- Australian Research Council linkage proposals and other leveraged funding opportunities.

The Work Program can also include in-kind and knowledge transfer activities, capability building, training, professional development and work experience opportunities.

Table 1 provides an overview of the current 2019-20 projects and their current status.

Table 2 (below) outlines the 2019–20 projects, defining their scope, alignment to TMR strategic priorities and status at the end of the period.

Summary of TAP Work Program 2019-2020

Table 1: Current status of TAP 2019-20 projects

Project	Current Status
Customer experience measure from existing network performance data	Complete
Pedestrian level of service metrics	Complete
Development of a motorcycle safety review methodology	Complete
Queensland electric bike survey (Stage 1)	Complete
Study of travel behaviour in QLD using economics (Stage 1)	Complete
Analysis of multi-combination vehicle crashes on state-controlled roads (Stage 4)	Complete
Tactical urbanism and cycling	Complete (July 2020)
Potential application of blockchain technology for dangerous goods	Complete (July 2020)
North Brisbane bikeway evaluation	Ongoing
Potential applications of blockchain technology (tracking vehicle ownership)	Ongoing
Alternative model form and structures – Travel Demand Model	Ongoing
Accessible public transport infrastructure study	Ongoing
Demand Responsive Transport (DRT) trial evaluation	Ongoing
Decline of cash purchases of public transport tickets investigation	Ongoing
Literature review of planning for constrained multi-modal corridors	Ongoing
Modelling public transport performance measures	Ongoing
Better use of public transport ticketing data	Ongoing
Optimised sampling for targeted evaluation of transport modelling uncertainty	Ongoing
Feasibility study using electric bus technology on the QLD public transport network	Ongoing
Potential applications of blockchain technology (digital licensing) *	Discontinued

*The project was discontinued due to data quality and the lack of readily available support information



The TAP Annual Work Program 2019-2020 Status Report

Table 2: Transport Academic Partnership 2019–20 Work Program.

Project	TMR Strategic Priority					Scope	Expected outcomes	Status at end of 2019–20	Partners
	Customer focus	Liveable Regions & active cities	Innovation	Investing in the future	Building prosperity				
Customer experience measure from existing network performance data		X	X	X		This project will explore the development of customer journey experience measures that can be derived from existing TMR datasets. The project will: explore use of existing datasets for development of the measure/s of customer journey experience.	Improved evidence of customer experience based on existing performance metrics – to help provide holistic view through an investment portfolio.	Completed (June 2020) Output: Literature review of customer-focused measures of journey experience derived from asset and infrastructure data. Methodology for assessing the individual customer experience of a point or route on the road network based on existing network measures. Outcomes: This project has identified key insights into customer experience through data analysis.	University: QUT TMR, IMD
Tactical Urbanism and Cycling		X	X	X		Research how agencies might use the tactical urbanism approach to trial, test and win support for changes to build environments which encourage cycling. Appraisal of the City of Gold Coast's Tactical Urbanism program.	Develop an industry friendly report, and a publication in either a peer-reviewed conference or journal on how tactical urbanism can be used to encourage cycling. Possibly present research through seminars and workshops.	Completed (July 2020) Output: A report and publication in a peer-reviewed journal. Outcomes: This project helped to highlight and understand the limitations of the existing cycle infrastructure, garner wider-community support and allow governments to trial potential alterations, before committing public funding and resources.	University: Griffith TMR, Policy, Planning and Investment Division, Transport Strategy and Planning Branch
Pedestrian Level of Service Metric	X	X				Research and develop a Pedestrian Level of Service (PLOS) audit tool. Develop recommended improvements to Austroads guidance for PLOS calculations.	PLOS audit tool. Develop an industry friendly report, and a publication in either a peer-reviewed conference or journals.	Completed (August 2019) Output: This project experienced some delays but is now complete. Final tested PLOS tool and full thesis from PhD student was received and is now available on SharePoint Library. Outcomes: A step towards safer and sustainable pedestrian facilities for end users by using BP guidelines.	University: Griffith TMR, Policy, Planning and Investment Division, Transport Strategy and Planning Branch
* Age friendly mobility services	X	X	X			Gather data on the travel behaviours and preferences of older adults. Identify priority projects that can effectively improve older adult access to transport services.	Contribute to a data gap regarding the travel behaviours and related technological preferences of older adults in Queensland. Influence transport planning, policy and decision making in Queensland, improving the lives of aging Queenslanders.	Ongoing (Leveraged project) Output: Online survey – initial findings report Outcomes: The initial online survey was completed by more than 600 Queenslanders over the age of 65. The initial findings have been drafted in a report and have helped form a series of focus groups across Queensland which are currently underway. The focus groups were completed, with findings summarised in a final report and were delivered at the 2019 TAP Showcase.	University: UQ TMR, TransLink Division
Development of Motorcycle Safety Review Methodology	X	X	X			This project will develop a guide detailing the motorcycle specific safety review methodology, risk assessment method including BCR estimation, instrumented motorcycle data analysis and reporting of motorcycle risk.	TMR will use these safety reviews to better identify risks to motorcycles. It is expected that findings of Motorcycle Safety Reviews using the instrumented motorcycle would help to identify and treat high risks motorcycle locations across the state.	Completed (July 2019) Output: Two new safety assessment methods developed. Outcomes: Final report received. Two new important safety assessments methods have been developed: (1) motorcycle specific road safety audit methodology, and (2) a motorcycle specific risk assessment model within QRAM framework for risk rating of roads for motorcycle crash risk.	University: QUT TMR, Customer Services, Safety and Regulation, Safer Roads Infrastructure

Project	TMR Strategic Priority					Scope	Expected outcomes	Status at end of 2019–20	Partners
	Customer focus	Liveable Regions & active cities	Innovation	Investing in the future	Building prosperity				
Alternative model forms and structures for a SEQ Travel Demand Model			X	X		The intention of this research is to identify a more robust methodology, other than the current state of replicating the same form of the smaller strategic models for the whole SEQ using larger transport model zones. The process should allow forecast changes in trip distribution and mode choice between the sub-regions of SEQ to be made.	The results of this study will be used to scope the effort required and the benefits that could be achieved by adopting a new model form, compared to using a SEQ-wide version of the BNE model.	Ongoing (Expected completion – June 2021) Output: PhD student placement in TMR delivered a paper on the public and private school travel behaviour has been accepted in the ATRF conference. Outcomes: This project focussed on the issues of market segmentation for mode choice modelling in the Brisbane and SEQ travel demand models to provide insight into the most efficient model to adopt.	University: Griffith TMR, Policy, Planning and Investment Division, Transport Strategy and Planning Branch
Potential applications of blockchain technology: visibility of chain of responsibility for hazardous and dangerous materials	X		X	X		The project should consider any specific use cases relating to the tracking of vehicle registration that has been tested in conjunction with blockchain, determine their stage of completion outline the key outcomes of these use cases, including any potential benefits attributed to blockchain.	Final report including recommendations for government involvement in blockchain research and design/trialling and indicative timeline of blockchain technology applications to transport based on adoption curve theories.	Completed (July 2020) Output: Final report received, including recommendations for government involvement in blockchain research and design/trialling and indicative timeline of blockchain technology applications to transport based on adoption curve theories. Outcomes: This project has allowed for a greater understanding of applications for financial applications in transport.	University: Griffith, QUT, UQ TMR, Policy, Planning and Investment Division, Transport Policy Branch
Decline of cash purchases of PT tickets investigation	X	X		X		Research into the likelihood and timing of declining cash use impacts on PT ticketing. Research will consider trends in new cashless payment technologies & methods with potential take up rates and barriers (incl. demographic & geographic differentials) indicators to improve preparedness and transition in the PT context impacts and benefits to government.	This program will consider the potential likelihood and timing of cash use on PT and the wider economy in light of new payment methods being introduced to allow for a smooth transition away from cash.	Ongoing (Delayed due to COVID) Output: The resulting research report will be used by TMR to move towards a cashless system. Outcome: TMR will gain a better understanding of cash usage patterns on public transport. This project had a face to face interview requirement. A new end date is yet to be confirmed.	University: Griffith TMR, TransLink
Modelling PT performance measures		X	X	X		Develop a methodology and model for evaluating the relationship between subjective customer satisfaction and objective numerical metrics. The project seeks to understand the general form, and establish and quantify in the detail, the empirical relationships between subjective customer satisfaction feedback and objective observed measures of attributes relative to network performance.	This project will allow for a detailed understanding between subjective customer satisfaction and objective numerical metrics models to better invest in network performance.	Ongoing (Expected completion – Early 2021) Output: A methodology framework and a numerical metrics model. Outcome: An understanding of the relationship between customer satisfaction and network performance. A draft thesis was submitted to TransLink in June 2020. UQ have not received a response.	University: UQ TMR, TransLink
Demand Responsive Transport trial evaluation: Estimate project value	X	X	X			This project will support the evaluation of the Logan Demand Responsive Transport (DRT) trials and will assist TMR in considering the future rollout of micro transit services across Queensland including regional areas.	This research policy will support TMR with the analysis and evaluation of a new form of passenger transport service – Demand Responsive Transport – which is currently being trialled in select suburbs of the Logan Local Govt. Area to provide an understanding of the socio-spatial impacts of the DRT trial.	Ongoing (Expected completion – July 2021) Output: Publicly available research paper detailing: Review paper providing understandings of DRT and new innovations in the field, including service models. Outcomes: Project will help understand the future implementation approach for more flexible public transport services that better meet customer demand.	University: Griffith TMR, TransLink
Queensland Electric Bike Owner Survey	X	X		X		The purpose of this project is to understand who, how, when, here and why people ride electric bikes. The project will also look at the potential for e-bikes in Queensland and what could encourage more use.	Peer reviewed report and publications will disseminate the findings of the research to determine the factors behind uptake and how it translates for future policies on this type of transport.	Complete (December 2019) Output: e-bike charging report, e-bike owner survey Outcomes: Informative research that will start an informed discussion about e-bikes as part of the transport network.	University: QUT TMR, Transport Strategy and Planning Branch

Project	TMR Strategic Priority					Scope	Expected outcomes	Status at end of 2019–20	Partners
	Customer focus	Liveable Regions & active cities	Innovation	Investing in the future	Building prosperity				
Literature review of planning for constrained multi-modal corridors		X	X	X		This project will deliver a literature review investigating transformative planning proposals similar to the situation with the South Coast Region Project Plan (SCRPP), specifically addressing key issues around encouraging mode shift, urban renewal, loss of parking and property impacts.	This academic research has the potential to derive a better outcome for the study of upgrading constrained corridors. The research findings will support a TSPP planning project currently underway for the Gold Coast Highway (around Palm Beach) in the South Coast Region.rs in the future.	Ongoing (Expected completion – June 2021) Output: The resulting evaluation methodology will be used by TMR to coordinate evaluation project planning. Ultimately, once complete, the evaluation measures are likely to be published by TMR on the website, be presented at several conferences, and represented in academic publications. Outcome: The ability to make sound investment decisions for infrastructure development methodology.	University: Griffith TMR, PDO (South Coast)
Study of travel behaviour in Queensland using behavioural economics	X	X				The scope of the project is to develop a better understanding of how people make travel decisions, including behavioural economics. The project will assess the varying behavioural and demographic factors that determine travel choices and building on TMR's in-house choice models via the inclusion of additional variables and/or using alternative modelling techniques.	Enhanced transport modelling will allow for more accurate project appraisals and lead to more effective and targeted expenditure.	Completed (June 2020) Output: Literature Review, Data collection and analysis. Outcomes: Gained insights from this study now have readily translatable to models that better capture travel behaviour and reveal more information relative to current practice. In turn, better modelling travel behaviour translates into a superior understanding of customers preferences and decisions which can be used to develop policy recommendations.	University: QUT TMR, Policy, Planning and Investment Division, Transport Policy Branch
North Brisbane Bikeway evaluation methodology		X	X	X		This project (Stage 1) will develop a comprehensive methodology for evaluating the impacts of the North Brisbane Bikeway, along with an evaluation action plan to identify data collection requirements and timeframes to ensure that all essential data is captured in a timely fashion by TMR and Brisbane City Council.	This program will enable TMR to evaluate the impacts of the North Brisbane Bikeway (NBB), and create an action plan to identify data collection requirements and timeframes to ensure that all essential data is captured and used to make informed decisions about investment in infrastructure.	Ongoing (Stage 1: Expected completion – November 2020) Output: Evaluation methodology will be used by TMR to coordinate evaluation project planning. Outcomes: Sound investment for infrastructure development methodology.	University: Griffith TMR, Policy, Planning and Investment Division, Transport Strategy and Planning Branch
Optimised Sampling for Targeted Evaluation of Transport Modelling Uncertainty	X	X		X		This project will help TMR understand how reliable transport model forecasts could be and therefore improve confidence in decision making. The project scope will include identifying & negotiating inputs determining the range of input variable uncertainties review against other studies or datasets develop & implement a methodology that can be applied to the latest version of SEQSTM_MM.	This project will help TMR understand how reliable transport model forecasts could be and therefore improve confidence in decision making.	Ongoing (Expected completion – December 2020) Output: it is expected a tool and example of a 'how to' guide sampling from input distributions Outcomes: The results should show the share of uncertainties contributed from possible interactions/concurrency between uncertainty sources.	University: UQ TMR, Policy, Planning and Investment Division, Transport Strategy and Planning Branch
* The road to compliance: Integrating three theories <i>Australian Research Council – Discovery Early Career Researcher Award</i>	X	X	X	X		This project aims to reduce young driver deaths and injuries by developing an integrated theory of road policing using the elements of deterrence, procedural justice and third-party policing approaches. The project expects to generate new knowledge in road policing which represents a resource intensive area of policing activity.	The expected outcome of this project is an integrated theory of road policing that can better inform interventions for young driver compliance. This should provide significant benefits including a reduction in the cost of crashes involving young drivers, which cost nearly \$5.5 billion from 2006-2015.	Ongoing (Expected completion date is yet to be confirmed due to staff availability). Output: an integrated theory of road policing that can better inform interventions for young driver compliance. Outcomes: PhD student recruited and established; a first online survey of 800 Queensland and Victorian drivers is completed; a second survey of around 240 respondents underway; first paper from Study 1 submitted for publication.	University: Griffith TMR, Policy, Planning and Investment Division, Transport Strategy and Planning Branch

Project	TMR Strategic Priority					Scope	Expected outcomes	Status at end of 2019–20	Partners
	Customer focus	Liveable Regions & active cities	Innovation	Investing in the future	Building prosperity				
Better use of public transport ticketing data	X	X	X	X		This project will develop a model/code/algorithm to analyse go card data to inform transport modelling and facilitate better forecasting and analysis for transport planning projects. The project will look at: observed elasticities of patronage/ demand in response to a decrease in travel time understanding habitual behaviours variation in response to weather events inferring trip purpose based on time patterns.	This program will consider the potential likelihood and timing of cash use on PT and the wider economy in light of new payment methods being introduced to allow for a smooth transition away from cash.	Ongoing (TBC – The project commenced in September 2020 after experiencing delays due to lack of data) Output: Sound investment model for cashless payment options likely to be published on the TMR website. Outcome: Understanding of how to inform transport modelling systems using customer data.	University: UQ TMR, Policy, Planning and Investment Division, Transport Strategy and Planning Branch
Analysis of Multi-Combination Vehicle (MCV) crashes on Queensland's state-controlled road network - stages 4 of Multi-combination & 5		X	X		X	This project is a staged project seeking to understand the safety associated with Multi-Combination Vehicle (MCV) by assessing 5 years of fatal and severe injury crashes from TMR crash data. This TAP project is for Stage 4 only, which includes A preliminary analysis to determine the types, numbers and severity of crashes involving single unit trucks and articulated vehicles (semi-trailers).	Better understanding of the involvement of heavy vehicle type on crashes. The intention is to feed into TMR heavy vehicle policy so that crashes involving heavy vehicles can be minimised.	Completed (June 2020) Output: Microsoft Excel spreadsheet with workings / data. Final Report is consistent with the Stage 1 report layout. Outcome: TMR now has a better understanding of heavy vehicle crashes and the data will now inform the next stage of the process.	University: QUT TMR, Customer Services, Safety and Regulation, Safer Roads Infrastructure LTS
Feasibility Study – using electric bus technologies on the Queensland passenger transport network	X	X	X	X		Feasibility study assessing and comparing the operational feasibility and requirements of three currently available electric bus technologies (plug-in hybrid, battery-electric and hydrogen fuel cell) on the Queensland public transport network. The study will consider trial route analysis, operational change requirements, overall costs and identification of transitional issues.	That routes suitable for electric bus trials will be identified to progress the transition to these new technologies.	Ongoing (Expected completion – September 2020) Output: A report to inform the feasibility of adopting electric buses on the Queensland network. Outcome: That routes suitable for electric bus trials will be identified to progress the transition to these new technologies.	University: UQ TMR, TransLink
* Understanding the barriers and prospects for cycle-tourism in Queensland with novel methods <i>Griffith University International Postgraduate Research Scholarship</i>		X			X	The broad aims of this study are to help identify current barriers to cycle tourism. Utilising existing secondary sources (tourist surveys, travel surveys, GIS datasets) and complimenting with primary data collection (surveys, field studies), this PhD proposal will undertake several research activities.	Outcomes will include a literature review, jurisdictional comparison research, surveys and modelling works. Published papers and reports.	On-hold (Leveraged project: This project did not progress to the 2020-21 work program and no update has been received). Output: Nil Outcomes: This project is on hold due to significant scope downscaling. Griffith has secured a replacement PhD student who will be delivering some of the 2019–20 work program projects, with an expectation that a series of additional work will be leveraged beyond that.	University: Griffith TMR: Policy, Planning and Investment Division, Cycling and Active Transport
Potential applications of blockchain technology: tracking vehicle, trailer and caravan ownership & registration (2)	X	X		X		The project should: consider any specific use cases relating to the tracking of vehicle registration that has been tested in conjunction with blockchain determine their stage of completion outline the key outcomes of these use cases, including any potential benefits attributed to blockchain.	TMR become aware of potential applications of blockchain technology as they apply in the transport sector for market/industry use, or as potential options for TMR's future provision of services.	Completed (July 2020) Output: A report providing an up-to-date status on blockchain technology's application in the transport and mobility sector, specifically as it pertains to asset ownership and registration tracking. The paper will help inform future research projects on particular application areas for TMR. Outcome: That government involvement in blockchain research and design/trialling and indicative timeline of blockchain technology applications to transport based on adoption curve theories becomes a reality.	University: UQ TMR, Policy, Planning and Investment Division, Transport Policy Branch

Project	TMR Strategic Priority					Scope	Expected outcomes	Status at end of 2019–20	Partners
	Customer focus	Liveable Regions & active cities	Innovation	Investing in the future	Building prosperity				
Potential applications of blockchain technology: digital identification (licensing)		X	X	X		In an initial pilot phase, the project is to undertake a literature review examining the applicability of blockchain technology for selected use cases of relevance to Transport and Mobility, and to draft the broad lines of the blockchain system architectures that would suit those use cases.	A mechanism (adopting Blockchain) for providing proof of licence and driving record for motorists on public roads by referring to a recorded entry on a blockchain – using adequate cryptographic techniques to prevent public exposure of personal details.	Discontinued Unfortunately, the data needed for this project did not become available.	University: QUT TMR, Policy, Planning and Investment Division, Transport Policy Branch
* Funding on the line: public transport financing and property value uplift Australian Research Council – Linkage Project				X		Modelling the timing and spatial patterns of property value uplift from recent investments in rail, busways and ferries to develop a potentially feasible scheme for implementation.	Development of a property value scheme to provide alternative funding for public transport investment. Provides detail on the timing and spatial patterns of property value uplift from recent investment in rail, bus and ferry infrastructure.	Completed (September 2020) Output: Honours student undertook a student placement with TMR to deliver project. Outcomes: This project experienced significant delays due to resourcing issues, however, a new Honours student has now completed the work.	University: Griffith TMR: Policy, Planning and Investment Division, Transport Policy Branch

*Leveraged project: a project initiated and led by a TAP University Partner which will benefit TMR but is not reliant on direct management or input from a TMR business area. No TAP funds are directly contributed towards these projects.

Multi-Combination Vehicle crashes on Queensland's state-controlled road network

Project lead: Safer Roads Infrastructure (IMD)
Partner: QUT

This TAP project is Stage 4 of a larger study regarding multi-combination heavy vehicle crashes. The objective of the project was to analyse five years of crash data to determine the main factors that contributed to fatal and serious injury crashes. The data collected regarded the type and size of heavy vehicles involved in crashes, the speed of the heavy vehicle and whether the road environment or weather conditions contributed to specific crashes.

The data showed the most common high frequency crashes were rear-end crashes (24.7%) followed by single vehicle crashes (24.4%) and head-on crashes (12.8%).

Other data/findings included:

- the fatality rate being highest (35%) in head-on crashes involving heavy vehicles (fatalities are predominately from light vehicles)
- the attribution of 'at fault' for each crash
- identifying similarities and differences with other types of heavy vehicles

It is now intended to use this study to initiate the next phase using advanced statistical analyses to determine the causes of heavy vehicle crashes and their severity.

The outcomes of this project will be used to help decision makers understand the nature, causes and injury outcomes of heavy vehicle crashes (including involvement in crashes). The information drawn from this study will also provide context for the design of strategies and interventions that will reduce crashes and their consequences.



TAP Sourcing Strategy

The TAP Sourcing Strategy was developed to provide a simplified and streamlined procurement process for R&D projects that align with the objectives of the TAP Agreement but are not able prioritised as part of the annual work program.

To be considered eligible projects must meet one or more of the following criteria:

- Research and/ or experimental development must be a key component of the project
- Build on previous research undertaken by the university
- Has the potential to lead to future research projects
- Investigate solution to known research gaps for the department
- Outputs benefit the department and the university (shared/ mutual interest).

In 2019-20, a further two new projects were procured through the sourcing strategy in the period, at a total value of more than \$80,000 (ex. GST).

Table 3: TAP Sourcing Strategy projects undertaken in 2019–20

Project	Project cost	Partners	Status
Express Gates consumer behaviour trial	\$25,000	University: QUT TMR Business Area: TransLink	Complete – July 2019 This project reviewed the methodology, data and results of the TransLink express gates trial at Central Station in Brisbane to understand customer behaviours and needs, explore concepts to improve customer experience, and enhance customer communications and messaging.
Longitudinal line marking interactions with members of the public	\$33,066	University: Queensland University of Technology TMR Business Area: Traffic Management Improvement, RoadTek Branch	Complete – August 2019 This project explored national and international processes for managing interactions between the work operations of slow-moving convoys and public motorist, as experienced by RoadTek line marking operations, to identify world best practice processes, increase safety for workers and road users, while improving work operations in Queensland.
Hydrodynamics and Hydraulic Design of Standard Culverts, to Assist Upstream Fish Passage at Less-Than-Design Flows	\$153,000	University: University of Queensland TMR Business Area: Engineering and Technology Branch	Complete – December 2019 (Stage 1) This project saw the development of a guideline/methodology to assist the upstream passage of small-body-mass Australian native fish species through box culverts. Stage 1 of the project had minor delays and the final stage report was completed in December 2019.

Project	Project cost	Partners	Status
Putting the Queensland Koala Expert Panel's Report into action: monitoring koala movements under transport infrastructure within a key regional biodiversity corridor on the Gold Coast.	\$50,000	University: Griffith TMR Business Area: IMD (PDO)	Complete – December 2019 Fauna detection technology was used to monitor current levels of koala movement and pathways in the vicinity of the Pacific Highway. These insights will inform the design of the Coombabah Creek Bridge structure for the proposed Coomera Connector, providing enhanced unrestricted koala passage between the key population areas on the eastern and western sides of the highway (Coombabah Creek and Nerang State Forest respectively).
* Two Seat Journey	\$25,000	University: QUT TMR Business Area: Safer Road Infrastructure	Complete – March 2020 The research from this project ascertained the perceived barriers to people in the community making the shift from one-seat-journeys to two-seat journeys, in order to combat congestion/emissions and to increase the take up of public transport.
Cooperative and Automated Vehicles (CAVI) Roadworks and Signal Use Cases.	\$50,000	University: QUT TMR Business Area: Safer Roads Infrastructure	Complete – June 2020 This project explored improvements in the provision of EU standard connected vehicle data in support of the connected and/or connected and automated vehicle, including testing the connected vehicle roadworks & signal use-cases and (if possible) the connected-automated vehicles use of signal data.
Video Analytics Trial	\$359,250	University: University of Queensland TMR Business Area: Safer Roads Infrastructure, Land Transport Safety Branch	Complete – June 2020 This project examined conflict points between various road users at intersections. Researchers collected data by placing video recording units at several sample of intersections in Brisbane without the need to disrupt traffic. The findings are being used to inform revised design practices. The final report was received at the end of June 2020 and is now on the TAP Library Site on SharePoint.
* TMR Strategic Research Roadmap	\$55,000	University: Griffith TMR Business Area: Customer Experience PPI	On-hold The aim of developing the strategy and road map was to clarify TMR's vision and understanding of the role of R&I in Customer Experience for the department. These insights also provide a capability uplift in the research area for TMR staff This project is to be restarted in the new year.

*New projects added to the sourcing strategy program in the period

Conclusion

The TAP partners have delivered a positive program that supports the objectives of the TAP Agreement throughout 2019-20, achieving a significant transport-related research and development work program.

The program has delivered innovative transport-related research outcomes and solutions through projects in the areas of transport modelling and planning, road and motorcycle safety, cycling evaluations and transport economic assessments.

In addition, the partners have delivered a wide range of research papers and reports and have undertaken peer reviews delivered on several topics including public transport, traffic analysis and congestion, network performance, and driver attitudes and behaviours.

Performance highlights include:

- University partners have been able to leverage and match more funding than the previous two financial years with over \$1.6M being contributed to the program.
- TAP partners have published more than 150 transport-related research papers (including journals, reports and peer reviewed articles and entries).
- Six projects have been completed in the period, an increase from three in the previous year.
- Over 50 collaborative projects were undertaken with industry, government and academia.
- The number of higher degree students undertaking transport-related research increased considerably in the 2019-20 period as did the number of academic staff within the university transport research sector.

This result is due to the efforts of our university partners, both staff and students who have been responsible for the day to day delivery of the transport research program. This work has been supported by the thoughtful and positive contributions of a wide range of TMR staff.

The Future of TAP

As this is the last year of the current 2015-20 agreement a Final Program Review was undertaken and found that the performance of the TAP partners in delivering the objectives of the TAP Agreement was satisfactory.

The Review also identified recommendations for a number of minor improvements to be made in future including communication, procurement and administrative processes, and strengthening the alignment to government priorities and delivery processes.

A new TAP Agreement 2020-2025 has now been established and will enable TMR and the university partners to build on our established strong partnerships to continue to undertake outcomes-focused, innovative R&D activities. In addition, the new agreement will seek to leverage our strategic transport capability and knowledge transfer between government, industry and the academic sectors to help address future transport challenges.