



THE UNIVERSITY OF  
**SYDNEY**  
—  
Business School



**MONASH**  
University

# Key Centre Annual Report 2024

The Commonwealth Key Centre  
of Teaching and Research  
in Transport Management

Institute of Transport Studies  
Monash University

<https://www.monash.edu/engineering/its>

Institute of Transport and Logistics Studies  
The University of Sydney

<http://sydney.edu.au/business/itls>

Institute of Transport and Logistics Studies  
University of Sydney Business School  
The University of Sydney  
NSW 2006

March 2025

Centres Coordinator  
Australian Research Council  
GPO Box 2702  
Canberra ACT 2601

Dear Centres Coordinator,

I hereby present to you, in accordance with the Australian Research Council's requirements for continued Key Centre status, the report of the proceedings and outputs for the Commonwealth Key Centre of Teaching and Research in Transport Management (established 1995) for the year ended 31 December 2024.

ITLS held its five-year retreat in February 2024 developing the 2025-2029 Strategic Plan which is already on target with our commitments, including a revamped HDR program to support our PhD students. Monash is undertaking its review in early 2025.

The growth in the ITLS short course portfolio is outstanding, especially the micro-credentials in intelligent supply chain management and data science and artificial intelligence, making these courses an essential feature in the future of ITLS. The Public Transport programs at Sydney and Monash continue to attract a growing number of participants making them an important part of our success and indeed the discrete choice analysis and infrastructure courses attract good numbers.

Overall, we continue to be ranked as the top research group in Australia and I am delighted to be named as the world leader in transportation for the second year and to receive the Business School Excellence in Research Award. In addition, the Awards section of this document showcases the many accolades being bestowed upon our staff in both the teaching and research domains.

I commend this Annual Report to all readers who will seek the breadth and depth of the contributions from Sydney and Monash.



A handwritten signature in black ink, which appears to read "D Hensher". The signature is written in a cursive style and is enclosed in a thin black rectangular border.

Professor David Hensher AM

Key Centre Director  
Director, Institute of Transport and Logistics Studies

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# Constitution

The primary object of the Key Centre is to undertake graduate teaching, executive programs, grant and contract research and development in the fields of transport, logistics and supply chain management studies.

The work of the Key Centre also has the following objectives:

- To provide a focus for University work in areas of transport and logistics management and to establish an ambience attractive to those committed to excellence in graduate transport, logistics and supply chain management programs and research.
- To collaborate, to the fullest extent possible, with other parties having an interest in transport, logistics and supply chain management studies and its applications.
- To offer specialised training courses, workshops, short courses and seminars on topics of interest in the area of transport, logistics and supply chain management.
- To seed the development, in Australia, of innovative ideas in transport, logistics and supply chain policy and professional practice in which the Key Centre plays a role.

These objectives are achieved by the Key Centre through:

- developing and offering graduate transport and logistics management programs, industry programs, certificates, executive programs and short courses;
- bringing high quality transport, logistics and supply chain management programs to people outside Sydney and Melbourne (both nationally and globally), as well as widening the offerings of courses within Melbourne and Sydney, through access to courses provided by both ITLS-Sydney and Monash ITS;
- contributing to Australia's growing participation in the Asia Pacific region in a leadership role in transport, logistics and supply chain management;
- widening the range of courses available for middle level professional managers in critical areas of transport, logistics and supply chain management not currently served;
- equipping managers in all disciplines (i.e., engineering, economics, planning), the small business sector and local government to succeed in the face of technological, economic and institutional change;
- building on the recognised need for stronger links between education of engineers, planners, policy analysts and managers in transport, logistics and supply chain management;
- undertaking research to develop state-of-the-art management practices and technical methods; and
- transferring the knowledge developed through research to client groups through the Key Centre's publications, workshops, conferences, seminars, and by participation in networks of transport, logistics and supply chain stakeholders.

# ITLS Board of Advice

The ITLS **Board of Advice** actively supports the continued development and utilisation of ITLS as a centre of excellence adding value to the community. The academic and commercial membership of the Board gives a broad network for the sharing of expertise and experience. We welcomed three new local members and for the first time appointed a Deputy Chairperson, Cecilia Warren.

## New members in 2024

Xiaolin Gong  
PhD Representative, ITLS

Aitan Militao  
PhD Representative, ITLS

Alan Win  
Managing Director – Middlebank Consulting Group and Honorary Professor, ITLS



*Board of Advice meeting, November 2024*

# Monash ITS Advisory Committee

The Monash ITS Advisory Committee plays an important ongoing role in strategic engagement between Monash ITS and its public and private sector stakeholders. The Advisory Committee ensures that Monash ITS research and education activities reflect and respond to the evolving needs of key stakeholders. This is of increasing importance in the rapidly changing social, economic, environmental, technological and political environment in which the transport profession currently operates. Most recently the Advisory Committee played an informal, yet central, role in the design of our Master of Transport and Mobility Planning. That stakeholder input helped to identify the key elements required in a masters that integrated the study of transport and mobility, in an urban land use context.

Advisory Committee meetings were put on hold during the COVID-19 pandemic, but will be resuming this year with the following membership:

- Michael Hopkins, Chief Executive Officer & Commissioner, National Transport Commission (Committee Chair);
- Paul Carter, Associate Principal, Arup;
- Peter Kartsidimas, Director, Integrated Transport Advice, Department of Transport and Planning;
- Niall McDonagh, Director, Sustainability, Assets and Leisure, Glen Eira City Council;
- Laura Aston, Senior Consultant and PhD Graduate; and
- Leigh Furness, Director, Traffix Group.

# Teaching and Learning

## Award Programs

### Undergraduate

In 2021 the 'Minors' were introduced into the Engineering degree at Monash University. This provided the opportunity to introduce CIV4100 Autonomous Vehicle Systems as part of the Artificial Intelligence Minor. Enrolments in CIV4100 quickly increased to between 60 and 70 students.

After extensive consultation with industry and department colleagues, in 2023 we obtained approval to introduce a new Minor in Transport. Beginning in 2024. This Minor provides students with the skills to tackle the complex challenges of modern transport systems. Students from anywhere in the Faculty of Engineering can complete four of the following units to obtain the Minor:

- CIV4100 Autonomous vehicle systems;
- CIV4284 Sustainable Traffic Systems;
- ENE2021 Energy and the environment;
- ENE4042 Environmental impact and risk assessment; and/or
- MEC5221 Railway Engineering.

### Postgraduate Coursework

**Master of Transport and Mobility Planning:** New in 2024, the Master of Transport and Mobility Planning (MTMP) emphasises the integration of innovation and technology into urban planning to influence positive system change and improve mobility options for city residents and visitors. It is the first Master in transport planning offered in Australia and is designed for graduates from a range of backgrounds including planning, civil engineering, urban design or other relevant fields. It is based on multidisciplinary units already available at Monash.

By exploring the links between urban land use planning and transport and mobility, students gain an understanding of how those relationships are challenged by emerging trends and technologies. From this, students will develop informed solutions to project-based real-world case studies. The masters also delves into the realm of travel demand modelling, enabling students to design effective transport strategies and infrastructure.

In 2024, ITLS-Sydney continued to offer a suite of postgraduate units of study in Logistics and Supply Chain Management, Transport and Infrastructure. In the Master of Commerce, ITLS-Sydney offers a specialisation in Global Logistics, which has a strong managerial focus. ITLS also offers the Master of Transport in conjunction with the Faculty of Engineering and the Faculty of Architecture, Design and Planning. Our programs are designed to allow students to tailor their learning experience, with the ability to enter at Graduate Certificate, Graduate Diploma or Masters level. Students can also choose from a range of online and part time friendly units. ITLS academics also teach an undergraduate unit on Managing Food and Beverage Supply Chains and also teach into the highly ranked Master of Management and Master of Business Administration (MBA) programs.

### Postgraduate Research

The Key Centre has the largest higher degrees by research program in the transport and/or logistics field in Australia. Monash ITS had 43 continuing student enrolments and four PhD graduations. At ITLS, there were seven PhD graduations with 24 continuing students. Graduates have taken up positions with Transport for NSW, postdoctoral research at the University of Sydney, in facilities management and supply chain data analytics roles.

## Enrolments

Degree	Enrolments
<b>Institute of Transport Studies, Monash University</b>	
Doctor/Master of Philosophy	43
Master of Engineering	31
Master of Professional Engineering	39
Master of Advanced Engineering	1
Master of Transport and Mobility Planning	3
Master of Transport Systems	49
<b>Institute of Transport and Logistics Studies, University of Sydney</b>	
Doctor/Master of Philosophy	24
Master of Commerce	
Specialisation in Global Logistics	43
Specialisation in Global Logistics (Extension)	137
Master of Logistics and Supply Chain Management	190
Master of Transport	29
Graduate Diploma in Transport	1
Graduate Certificate in Transport	2
Graduate Diploma in Logistics and Supply Chain Management	8
Graduate Certificate in Logistics and Supply Chain Management	10

Unit of study	Enrolments
<b>Institute of Transport Studies, Monash University</b>	
<b>Undergraduate:</b>	
Traffic and Transport Engineering (CIV2282) (Clayton and Malaysia Campuses)	320
Road Engineering (CIV4287) (Clayton and Malaysia Campuses)	260
Traffic Systems (CIV4284) (Clayton)	39
<b>Postgraduate:</b>	
Traffic Engineering and Management (CIV5302)	62
Intelligent Transport Systems (CIV5304)	51
Planning Urban Transport Systems (CIV5314)	16
Road Engineering (CIV5177)	14
Intelligent Tsp Systems: Eng. and Management (CIV5318)	80
Quantitative Methods (CIV5319)	80
Case Studies in Transportation Systems (CIV5320)	80
Modelling Transportation Systems (CIV5406)	80
Sustainable Tsp Systems Planning (CIV5321)	80
Urban Public Transportation Systems (CIV5322)	80
<b>Institute of Transport and Logistics Studies, University of Sydney</b>	
<b>Undergraduate:</b>	
Managing Food & Beverage Supply Chains (ITLS2000)	32
<b>Postgraduate:</b>	
Production and Operations Management (ITLS5020)	128
Introductory Supply Chain Analysis (ITLS5050)	132
Transport & Infrastructure Foundations (ITLS5100)	65
Foundations in Global Logistics (ITLS5250)	99
Supply Chain Planning and Design (ITLS6002)	86
Humanitarian Logistics (ITLS6007)	5
Logistics and Supply Chain Management Systems (ITLS6010)	87
Managing Supply Chain Distribution (ITLS6015)	73
Logistics and Future Cities (ITLS6016)	7
Logistics & Supply Chain Project (ITLS6090)	81
Transport Modelling and Forecasting (ITLS6102)	21

Transport, Sustainability and Health (ITLS6103)	18
Spatial Analytics (ITLS6111)	94
Global Distribution Strategy (ITLS6201)	219
Sustainable Logistics and Procurement (ITLS6202)	204
Analytic Methods for Logistics (ITLS6203)	12
Maritime Management and Logistics (ITLS6300)	51
Aviation Management and Logistics (ITLS6410)	105
Decision Making on Mega Projects (ITLS6500)	19
Infrastructure Financing (ITLS6501)	18
Global Logistics Capstone (ITLS6600)	36

## Monash in Malaysia

The transport and mobility sector is facing a growing demand for highly skilled engineers and planners, driven by disruptive changes in the industry. Key factors include Malaysia's national target to achieve net zero CO<sub>2</sub> emissions by 2050, challenges posed by climate change, and the need for resilient transport systems and logistics as outlined in the New Industry Master Plan 2030. The transition to electric, alternative-fuelled, and autonomous vehicles introduces significant governance and infrastructure challenges. Inadequate public transport infrastructure and slow adoption of sustainable transport hinder the goal of increasing the public transport modal share to 40% by 2040 and 60% by 2050. In response Monash University in Malaysia has introduced a specialisation under the master of applied engineering master program in Smart and Sustainable Mobility.

Monash ITS' Dr Susilawati has established the Urban Transformation Network at Monash University Malaysia, a unique initiative that unites experts from various disciplines across Monash campuses. This initiative focuses on exploring diverse urban mobility projects, including promoting active and public transport and adopting emerging mobility technologies such as mobility on demand and electric vehicles. These efforts aim to shift urban mobility away from unsustainable practices that lead to traffic congestion and reduce carbon emissions. Data-driven solutions to urban mobility problems are employed by utilizing methodologies such as big data and AI-based geospatial analysis. Given the scale of these challenges, the continuous and collective effort of multidisciplinary scholars at Monash University Malaysia is essential for transforming urban environments into sustainable and resilient cities.

Dr. Susilawati has been working on various projects to address the public transport first mile and last-mile problem and boost public transport ridership. In 2019 she was awarded a Malaysian national research grant to develop the integration of Shared Autonomous Vehicle Model with Public Transport for First and Last Mile Connectivity. Dr Susilawati has also secured Malaysian government funding to develop a distance-based emission model to assess the impact of micro-mobility implementation as sustainable mobility on greenhouse gas (GHG) reduction in three locations in Klang Valley, Malaysia. Many studies by Monash ITS researchers show the crucial role that safe, separated infrastructure plays in supporting both scooting and bike riding, in Melbourne and cities around the world. These projects demonstrate the long-term capabilities of Monash ITS to provide further insights into the transport needs, attitudes and behaviours of our current and future cities.



# Professional Development ITLS

## Bus and Coach Accreditation Scheme Online Training Course

Transport for NSW is responsible for the regulation of public passenger bus services in NSW (including long distance, tourist and charter services). Under the Passenger Transport Act 2014, all operators of public passenger bus services must be accredited to be able to provide services legally in NSW. This online course, directed by Professor John Nelson, is approved by Transport for NSW as meeting the accreditation requirement of competency to operate bus and coach services; applicants must pass the course examination. The course includes four modules: i) Accreditation; ii) Management Information System; iii) Vehicle Maintenance Management System; and iv) Safety Management Systems. The training is delivered through online learning materials including notes, case studies, online quizzes and a discussion board. The Bus and Coach Operator Accreditation Scheme (BOAS) Online Training Course attracted **160 registrations** in 2024 which represented an encouraging return to pre-COVID levels.

## Discrete Choice Analysis: Models, Estimation and Applications

Almost without exception, everything human beings undertake involves a choice. In recent years there has been a growing interest in the development and application of quantitative statistical methods to study choices made by individuals or groups with the purpose of gaining a better understanding both of how choices are made and of forecasting future choice responses. Courses in discrete choice modelling and choice experiment design have been offered by ITLS-Sydney since 2006 and are presented by world experts in the field: Professor John Rose, Dr Andrea Pelligrini, Professor Michiel Bliemer and Professor David Hensher. In June 2024, we welcomed **28 participants** from across Australia and around the world, including Singapore.

## Railway Planning and Operations Program

The Railways Planning and Operations Program did not run in 2024.

## Travel Demand Management Course

The Travel Demand Management (TDM) course showcases the latest developments in TDM and enables participants to develop an appreciation of the techniques available in the TDM toolkit and gain an integrated understanding of key concepts, techniques and trends. As part of our collaboration with Transport for NSW, in 2024 we offered the Transport Demand Management short course across two days in August with **25 participants** including a field visit to Macquarie Park. The course is directed by Professor John Nelson.

## Infrastructure

The Infrastructure Short Course designed by our Adjunct Professor Martin Locke continues to grow with two sessions being held in 2024. Through guest speakers, panel discussions and group exercises the participants get the opportunity to increase their knowledge on everything from the structure and key elements of a business case to understanding important fundamentals when making an investment decision and how to successfully manage and deliver operating projects. The first course held in early October attracted **13 participants**. A second course was held later in the month for a delegation of **14 participants** from the Solomon Islands as part of a collaboration with the Solomon Islands Infrastructure Program.

## Certificate of Transport Management

Our popular Certificate of Transport Management short course was run in July attracting **58 student enrolments**. We were pleased to welcome participants from NSW, Queensland, Victoria, Northern Territory. This program has been designed by the Institute of Transport and Logistics Studies, in close co-operation with Transport for NSW and BusNSW enlisting the wisdom of over ten leading experts in various transport industries to enhance participants knowledge and skills for operating in the bus and coach industry in NSW. As well as the speaker presentations, the course delivered engaging panel discussions, gathered the team for a networking event and rounded off the last day with an interactive Networking Planning exercise allowing the students to put theory to paper. The course is directed by Professor John Nelson. We acknowledge our scholarship sponsors Transport for NSW (for Community Transport participants) Volvo (for women in transport) and (new for 2024) Futon Mobility Distribution for emerging leaders) and the Community Transport Organisation.

### Micro-credential Course in Industrial Automation

The micro-credential Introductory Data Science and AI for Supply Chain Management was held in June/July. Coordinated by Dr Jyoti Bhattacharjya and in partnership with GS1, Australia, the course attracted **25 registrants**.

### Mozambique Delegation

In mid-July, ITLS was honoured to host a delegation of six representatives from the Mozambique government who were here to explore learning and development opportunities and to understand more about public transport management. The visitors were associated with the Mozambique Ministry of Transport and Communications which is headed by ITLS alumnus, Minister Mateus Magala. Two delegates attended our Certificate of Transport Management course whilst the other visitors met with various government and bus and coach industry operators including a visit to the Transport Management Centre and an afternoon cruise on Sydney Harbour.

### “Cooee program” – Empowering First Nations Entrepreneurs: Building Prosperity

The primary goal of this new initiative which commenced in 2024 is to identify Aboriginal and Torres Strait Islander individuals who have already engaged in developing a small business and empower them to enhance their practical entrepreneurial skills to create profitable businesses. The program, which is organised jointly between ITLS and the Discipline of Strategy, Innovation and Entrepreneurship at the University of Sydney Business School, has been named the “Cooee program” (being the Aboriginal English word for “to call over distances”). The first course will be held in Sydney and thereafter we envisage that the course will be regionally based with a likely pattern of the course being delivered in one year alternating with business mentoring in the following year. The four-day program will include a series of modular units on a range of entrepreneurship topics, a capstone project, and a session on work-life balance.

## Professional Development ITS

### Planning Public Transport Services Short Course

Professor Graham Currie and Associate Professor Liton Kamruzzaman both taught at this course, held at Monash University’s Docklands campus. This course was run in association with the Monash University Public Transport Research Group, the Smart Public Transport Lab at Delft University of Technology, and the Technion-Israel Institute of Technology. The course had **30 participants** and provided the ultimate guide to public transport planning, operations and policy, with an objective of combining traditional operations and new approaches to service planning and finding solutions to difficult and persistent public transport problems. The course is scheduled to run again in September 2025, being held in Amsterdam.

### Transport digital twins

This covered data collection and processing for an integrated AI-Traffic simulation framework. It was run by Professor Hai Vu and Associate Professor Dong Ngoduy and was hosted by the Ho Chi Minh City Department of Transport.

### 1<sup>st</sup> Symposium of Monash Climate Resilient Infrastructure

Dr Susilawati chaired the Future Mobility session and presented a discussion on Transport Network Reliability. The event attracted **40 participants**, who received Professional Development Points from the Institute of Engineering Malaysia (IEM).

# Student Awards

The Key Centre recognises the achievements of its students and alumni through industry and government sponsored prizes that are presented at annual award ceremonies where our students and alumni joined our Board members, industry partners, and the sponsors of prizes to celebrate the success of our students.

ITS-Monash's awards include:

- Ramisa Bhuiyan (Undergraduate civil engineering student), Outstanding Paper Award from the Bicycle Committee at 103rd Annual Meeting of the Transportation Research Board for Reynolds J, Bhuiyan R, Currie G and Johnson M (2024) "Tram Bike Crash Risks: A Cyclist Market Survey" 103rd Transportation Research Board Annual Meeting, 7-11 Jan 2024
- Lirui Guo, Best Student Presentation (Travel Behaviour Modelling) at the ATRF 2024 PhD Student Research Symposium.
- Fuad Huda, 2024 Rees Jeffreys Award certificate from the Institution of Civil Engineers (ICE).
- Fuad Huda, Best Presentation Awards in Transport Planning and Policy at the ATRF 2024 PhD Student Research Symposium.
- Mahesha Jayawardhena, David Willis Memorial Prize for the best paper presented by a young researcher at the 2024 Australasian Transport Research Forum.
- Zheng Xu, Best Paper Award from the Journal of Multimodal Transportation
- Pranav Ramsahye and Hamza Zubair, Gold Award at the 4<sup>th</sup> Malaysian Road Conference – Invention and Innovation Exhibition

ITLS-Sydney's 2024 Awards Presentation Evening was held on 24 May and the following prizes were awarded:

- Yubei Feng: Mrs Ma Ching Prize to an international student for the highest academic achievement in a transport, infrastructure and/or logistics and supply chain management specialisation in the Master of Commerce
- Alexander Cooper: Peter Koning Memorial Award for the domestic student with the highest academic achievement in a transport, infrastructure and/or logistics and supply chain management specialisation in the Master of Commerce.
- Kohei Tsuchida: The Wendy and Christopher Adam Prize (HDR Students)
- Sam Zareh Andaryan and Jinadari Prabodhika: The Wendy and Christopher Adam Prize (HDR Symposium presentation)
- Onang Nugroho: GS1 Australia Prize for the highest academic achievement in the Contemporary Procurement unit of study (ITLS6010)
- Rowan Sargeant: GS1 Australia Prize for the highest academic achievement in the Production and Operations unit of study (ITLS6201)
- Timothy Heron: Supply Chain & Logistics Association of Australia Award for Excellence for the highest academic achievement in the Master of Logistics and Supply Chain Management
- Wei-Ting Hong: ITLS Studies Prize for excellence in postgraduate research in transport, logistics or supply chain management
- Jessica Kane: Bus NSW Certificate of Transport Management Prize

# Research and Consultancy

FUNDING AWARDED OR ANNOUNCED IN 2024

## Australian Research Council Discovery Project Grants

Professor John Rose (led by University of NSW)

### **Integrating land use, market equilibrium and transport for city planning**

(2024-27, AU\$491,742)

This project offers a comprehensive travel demand modelling platform that provides realistic, robust, and self-consistent metrics for transport infrastructure planning addressing contemporary changes in the transport system. The expected outcomes of the platform are incorporating recent advances in activity-based methods for travel demand modelling, developing a dynamic and integrated system for modelling short- and long-term household decisions, and creating a systematic calibration mechanism to handle the large-scale model.

Associate Professor Liton Kamruzzaman, Professor Hai Vu and Professor Graham Currie

### **Discovering the sustainable size of cities.**

(2025-2027, AU\$544,087)

This project aims to theorise sustainable city sizes and develop a model to assess the impacts of impending high-speed rail on achieving these sizes across Australian cities. The project will generate new knowledge on city size dynamics, employing an innovative method that blends interdisciplinary approaches. Expected outcomes include a theory of sustainable city size, Australia's first national level urban/transport model, a novel method informing high-speed rail planning, and a new approach to population distribution and urban growth management. The outcomes benefit Australia by reducing the burden of imbalanced population distribution (costing \$200B/year) through a proactive planning of \$200B investment in high-speed rail.

## Other External Research Funding

Professor John Rose, Dr Andrea Pelligrini

### **Investigation into the economy wide implications of large-scale price reductions in public transport. A case study from Queensland's 50 cent fare trial**

(2024, AU\$500,000 over 3 years)

CRC Research Agreement, iMOVE Australia Ltd

This project is gathering insights on how the 50-cent Public Transport initiative will influence the following: direct and cross price arc elasticities for competing modes; public transport patronage; congestion on the road network; and cost of living impacts and household expenditure

Associate Professor Chinh Ho, Professor Stephen Greaves and Wen Liu

### **Developing a pilot methodology for collecting activity data on road use by cyclists, pedestrians and personal mobility devices**

(2024, AU\$175,000 over 1 year)

CRC Research Agreement, iMOVE Australia Ltd

This project designs, tests, and validates a pilot methodology for harvesting activity data of active road users – pedestrians, cyclists, and other personal mobility devices.

Prof John Nelson, Prof David Hensher, Prof Corinne Mulley, Dr Edward Wei, Dr Thiran Kandanaarachchi, Dr Camila Balbontin and Wen Liu

### **Behavioural Change for Sustainable Transport**

(2024, AU\$360,000 over 2 years)

CRC Research Agreement, iMOVE Australia Ltd with ITS Australia, Department of Infrastructure, Transport, Regional Development and Communications and the Arts and Transport and Main Roads, Queensland.

This project is exploring attitudes and actions that are most likely to affect tangible change towards a more sustainable transport system. It will include recommendations for policy makers and operators to accelerate these changes through evidence-based policies and interventions

Dr Jyoti Bhattacharjya

**Development of an Inherent Risk Identification Tool (IRIT) for NSW public entities**

Office of the Anti-slavery Commissioner

(2024, AU\$63,452 over 1 year)

This is the second stage of developing an Inherent Risk Identification Tool (IRIT) that will be used by NSW public buyers in managing modern slavery risks in supply chains.

Professor John Nelson, Prof David Hensher and Dr Edward Wei

**Impact of long distance and regional trips on service delivery and review redistribution of trip outputs**

(2024, AU\$100,000 over 1 year)

Client Commissioned Research, Transport for NSW

Professor John Nelson, Prof Corinne Mulley and Arkar Than Win

**Synthesis, analysis, writing and document development of the FMTRC business plan**

(2024, AU\$47,650 over 1 year)

Client Commissioned Research, Transport for NSW

Provision of review and support for the business case team in developing the research and analysis needed for investment into the Future Mobility Testing and Research Centre (FMTRC) business plan.

Professor John Nelson and Dr Thiran Kandanaarachchi

**Independent Evaluation of the National Bus Safe Program Trial**

(2024, AU\$25,000 over 1 year)

Client Commissioned Research, Bus and Coach Association of South Australia (BusSA)

This project independently evaluates the Bus Safe trials in Tasmania and Queensland.

Professor David Hensher and Professor Xiaowen Fu

**Evaluating Demand and Feasibility for Mobility-as-a-Service (MaaS) at an Urban Scale**

(2024, AU\$733,349.61 over 3 years)

Academic Research Council, Ministry of Education, Singapore, Academic Research Council, Ministry of Education, Singapore

This project investigates the feasibility and appeal of such a digital mobility solution – Mobility-as-a-Service (MaaS) – in Singapore.

Associate Professor Dong Ngoduy

**AI-empowered traffic management systems**

(2024-2028, AU\$160,000)

Research and Development award by the Ho Chi Minh City Department of Transport for contributions towards the deployment of transport digital twin in Ho Chi Minh City (Vietnam).

Associate Professor Liton Kamruzzaman (external reviewer)

**Planning and policy settings for developers to integrate housing development with transport**

(2024, NZ\$5,000)

Served as an external reviewer of the research project undertaken by ARUP New Zealand for the New Zealand Transport Agency

Dr Susi Susilawati

**ASEAN NCAP Collaborative Holistic Research V**

(2024-2025)

ARUP New Zealand.

Dr Susi Susilawati

**Motorcyclists' interactions with autonomous vehicles: attitudes, behavioural control, and safety implications in mixed traffic environments**

Monash Warwick Alliance – Activation Fund.

## Significant Continuing Research Funding

### **iMOVE Co-operative Research Centre (CRC) (2017-2026)**

The Federal Government has granted a group of nearly fifty leading industry and research organisations known as the iMOVE Co-operative Research Centre (CRC), a total of \$55 million over ten years to explore intelligent transport systems including self-drive vehicles. Key members of the iMOVE CRC include Institute of Transport and Logistics Studies (ITLS) and the University of Sydney's Faculty of Engineering and IT.

In 2023, ITLS continued to work on the following iMOVE projects:

Prof John Nelson, Prof David Hensher, Prof Corinne Mulley, Dr Chinh Ho, Dr Edward Wei, Dr Camila Balbontin

#### **Establishing a Framework of Support to Scale in Mobility as a Service**

(2023-2025, \$600,000)

iMOVE CRC with TMR, Queensland

This project seeks to consider the (ideal) MaaS framework that benefits users and providers in a sustainable way. The project is developing and evaluating a testable governance framework which sets out a number of ways that non-mobility service providers might see as an appealing way of participating in a scalable ecosystem.

Prof Michael Bell, Dr Supun Perera

#### **TRIPS – A tool for curating land use trip/parking generation surveys and travel plan monitoring**

(2023-2025, \$600,000)

iMOVE CRC with TMR, Queensland

Professor Michiel Bliemer (led by University of Queensland)

#### **Safe and efficient eco-driving using connected and automated vehicles**

(2024-28, AU\$687,578)

ARC Discovery Project Grant

This project aims to solve the paradox of trading off liveability for mobility by simultaneously reducing traffic congestion, vehicle energy consumption, and emission.

Professor John Nelson (led by University of NSW)

#### **Community Self-determination in the era of automated home delivery systems**

(2023-27, AU\$515,000)

ARC Discovery Project Grant

The aim of this project is to deliver the critical information inputs required to empower and protect communities in a future characterised by the widespread use of automated product deliveries.

Professor John Nelson and Dr Yuting Zhang (with the Australian National University and Transport for NSW)

#### **Healthy, Equitable and Sustainable Urban Mobility**

(2022-26, AU\$520,487)

ARC Linkage Project Grant

This Project is implementing an evaluation framework to explore the extent to which the implementation of “pop-up” cycleways and other measures to promote Active Travel, including as part of journeys by public transport, in both green field and established locations, and explore how it may result in long-term behaviour change and bring public health benefits.

Professor Stephen Greaves (with University of Tasmania)

#### **Improving Cardiovascular Health Through Increased Transport-Related Physical Activity: A Codesigned Randomised Controlled Trial for the Commonwealth of Australia MRFF Cardiovascular Health Mission**

(2022-2025, AU\$767,132)

This project aims to establish the impact on physical activity of a novel incentives-based strategy to increase public transport use through a single-blinded parallel group randomised controlled trial. Findings will provide public health and transport authorities with evidence to inform decisions around the use of incentives-based strategies.

Professor John Nelson, Prof Corinne Mulley and Dr Yuting Zhang

#### **E-Scooter Shared Scheme trial evaluation**

(2022-2025, AU\$240,000)

Client Commissioned Research, Transport for NSW

The project has developed and implemented a comprehensive Evaluation Plan for the shared e-scooter trial program which is focussed on a representative set of three councils, each with a trial of e-scooter shared schemes, selected with the intention of achieving a mix of metropolitan and regional contexts, different use cases, different e-scooter providers, available infrastructure and availability of public transport services.

Associate Professor Liton Kamruzzaman (with University of Sydney and University of Melbourne)

**Developing a governance model to build connections between infrastructure planning and strategic urban planning.**

Infrastructure Governance Incubator (Funded by the Henry Halloran Trust)

Infrastructure plays a vital role both in Australian economy and social well-being. However, often they lack social licenses to operate. This study streamlines the infrastructure planning process to better articulate citizens' approval and ownership. Informed by international best practices, the project aims to develop a novel infrastructure governance model for Australia enabling alignment between strategic planning and project delivery in terms of visioning and policy formulation, financing, and public engagement.

Professor Graham Currie and Associate Professor Liton Kamruzzaman

**The long-term effects of autonomous cars on land use, access and travel**

(2020-2025, AU\$199,962)

ARC Discovery Project Grant

Historically new transport technologies have significantly changed urban form in Australian cities with important business, economic, congestion, social and environmental impacts. Autonomous cars are said to revolutionise tomorrow's transport, but no research has yet considered long term impacts on land use and city structure. This project explores how land use and travel will change adopting innovative land use and transport models. Outcomes will better prepare Australia for an autonomous travel future.

## University Research Grants

Dr Yuting Zhang

**Business School Early Career Researcher Funding Scheme: Micromobility parking facilities at key interchange train stations: A study in Sydney, Australia**

(2024-2025 \$9,400)

Professor John Rose and Dr Andrea Pellegrini (with Civil Engineering, USyd)

**Future Transport Research Group Collaboration Scheme: Dynamic pricing, routing and charging in on-demand shared mobility**

(2024, \$7,500)

Dr Yuting Zhang (with University College London, UK)

**The University of Sydney – University College London Ignition Grants: Shared micro-mobility and social inclusion**

(2024-2025 AUD 19,800 + GBP 9,555)

Dr Wynita Griggs (with RMIT)

**International collaboration network on renewable- and EV-grid integration (2023-2027, \$3,828,629 project total)**

Dr Nan Zheng

**Monash-JITRI international collaboration grant 2024 (2024-2027, AU \$420,000)**

Autonomous truck driving systems: sensing and control technologies, control platform and service applications in open-pit mines

Dr Susi Susilawati

**Monash Incubator – Bolster**

Dr Rumana Sarker

**2024 Monash Advancing Women's Success Grant, (AU\$10,800)**

This grant is funded by the Monash University internal funding to explore the perceived personal safety of the female and gender-diverse transit users in Melbourne

Dr Rumana Sarker

**Early Career Research Support Scheme (Travel Grant) 2024 (AU\$5,000)**

This grant is supported by Monash University's Department of Civil Engineering to promote research collaboration with the School of Engineering at Monash Malaysia on the perceived personal safety of female transit users, and to facilitate teaching for the Unit CIV4283 - Transport Planning.

Dr Rumana Sarker

**2024 -25 Summer Research Program (AU\$5,000)**

**Topic: Assessing Transit Station Safety through an Integrated CPTED Approach**

Supported by a \$5,000 student scholarship, jointly funded by the Faculty of Engineering and Department of Civil Engineering



# Engagement

## Public Lectures and Seminars

### **ITLS Leadership and Policy Seminar Series and Research Seminar Series**

Established in 2003, the ITLS-Sydney Leadership and Policy Seminar Series benefits from leading national and international experts (CEOs, Visiting Professors etc.) speaking on topical transport and logistics issues relevant to business and academia. The seminar series attracts a broad audience from industry, government and academia as well as our own faculty and research students. The seminar conveners are Professors Rico Merkert and John Nelson.

Established in 2018, the ITLS-Sydney Research Seminar Series brings leading national and international research experts to share their current and most exciting research projects. The seminar series attracts a broad audience from industry, government and academia as well as faculty and research students. The seminar convener is Professor Michael Bell.

The following presentations were given in 2024. All sessions were held in a hybrid format:

#### **E-Scooters: Coming Soon to a Street Near You or Not?**

28 February 2024

Professor Stephen Greaves, ITLS, University of Sydney

#### **Community Transport: Challenges for a Promising Industry**

27 March 2024

Tara Russell, Community Transport Organisation

#### **The Nexus Between Major Infrastructure Developments and the Growth of Western Sydney**

24 April 2024

David Borger, Executive Director of Business Western Sydney

#### **Quantifying the Positive Externality of Transport Infrastructures: The Case of Airports and High-speed Rail Services**

16 August 2024

Professor Xiaowen Fu, The Hong Kong Polytechnic University

#### **Autonomous Food and Alcohol Deliveries: A Transport Revolution with Public Health Pitfalls**

25 September 2024

Professor Simone Pettigrew, University of NSW

#### **Revisiting Airports: On Non-aeronautical Revenues and Queue Jumping**

26 September 2024

Professor Binyamin Mantin, Luxembourg Centre for Logistics and Supply Chain Management

#### **Innovative Last-Mile Strategies for Sustainable City Logistics**

23 October 2024

Oliver Gallay, University of Lausanne

#### **When Will We Admit that Maritime Transport Will Not Be Decarbonised by 2025?**

30 October 2024

Jason Monios, Kedge Business School, France

## **Transport Research Association of NSW (TRANSW) Annual Symposium**

7 November 2024

The 7th Annual Symposium of the Transport Research Association for NSW was hosted by TransportLab at the University of Sydney on November 7, 2024. The event hosted more than 100 delegates from government, industry, and academia, with 36 oral and 20 poster presentations given by research students and post-doctoral researchers from the University of Sydney, UNSW, UTS, and the University of Wollongong.

## **ITLS HDR Supply Chain Symposium**

3 December 2024

This year's event, convened by Professor Behnam Fahimnia, involved five research student presentations covering a range of topics including the promotion of green energy transition in shipping and a review of B2C logistics in e-commerce.

## **ITS Seminars and Public Lectures**

### **A multidisciplinary approach to crowd safety: Integrating descriptive experiments, numerical modelling and behavioural interventions, and a pathway to generating the social sciences of crowds**

19 February 2024

Milad Haghani, University of NSW

### **Exploring e-bike financial incentives**

16 April 2024

John MacArthur, Portland State University, USA

### **Micromobility and the 'first and last mile' access problem**

6 September 2024

Padraic Carroll, University of Melbourne

### **The effect of Ease of Travel on travel behaviour, activity participation and travel satisfaction**

25 November 2024

Jonas De Vos, University College London, UK

## **Monash ITS Ogden Lecture**

Monash ITS did not run the Ogden Lecture in 2024, as it coincided with Monash hosting ATRF.

# Committees

- **Dr Matthew Beck**  
United States Transportation Research Board Committees: Stated Response (Chair)
- **Professor Michael Bell**  
International Symposium on Transport Network Reliability Scientific Committee (Chair, International Advisory Committee); United States Transportation Research Board Committee: Intermodal Freight; Member of International Advisory Committee, Hong Kong Society for Transport Studies (HKSTS)
- **Professor Michiel Bliemer**  
International Scientific Committee of the Dynamic Traffic Assignment Conference, Chair of the Transport Research Association for NSW, Member of the organising committee of the TRANSW Symposium 2022, Director Future Transport Research Group, Director Travel Choice Simulation Laboratory
- **Dr Geoffrey Clifton**  
Member Australasian Transport Research Forum – Public Transport Research Committee
- **Professor Graham Currie**
  - Land Transport Authority of Singapore, International Advisory Board Member; K2 Swedish National Centre for Research and Education on Public Transport - International Advisory Board Member; President, Australasian Transport Research Forum (ATRF); Chair, Public Transport Research Committee of ATRF; Editor Transportation (Springer)
- **Associate Professor Alexa Delbosc**
  - Member, Women and Gender in Transportation, Transportation Research Board (TRB) Standing Committee (AME20); Editorial Board of Transport Reviews
- **Dong Ngo Duy**  
Scientific committee member of TRISTAN 2025 and Traffic Flow Theory and Characteristics Annual Meeting
- **Prof Behnam Fahimnia**  
IEEE Technology & Engineering Management Society, Board Member; Supply Chain Association of Australia, Director and Board Member
- **Professor Stephen Greaves**  
Travel Survey Conference International Steering Committee; Australasian Transport Research Forum Executive Committee
- **Dr Wynita Griggs**  
ATRF 2024 Speaker Management Committee
- **Professor David Hensher**  
Advisory Board, Institute of Transport and Logistics Studies (Africa), South Africa; International Conference Series on Competition and Ownership in Land Passenger Transport, International Steering Committee (Chair), Partner, Volvo, Educational and Research Foundation Centre of Excellence in Bus Rapid Transit, Chile
- **Dr Chinh Ho**  
Permanent Scientific and Technical Committee, Cooperation for Urban Mobility in the Developing World
- **Dr Marilyn Johnson**
  - Amy Gillett Foundation Research and Policy Committee, Australasian College of Road Safety (Victorian Chapter), Australasian Road Safety Conference (Organising Committee, Scientific Committee (Chair)), CLOCS-A National Working Group, Road Safety Education Scientific Advisory Committee

- **Associate Professor Liton Kamruzzama**  
Chair, 2024 ATRF Local Organising Committee  
Track Chair, City Movement and Infrastructure, State of Australasian Cities Conference 2025
- **Martin Locke**  
Board member, Infrastructure Partnerships Australia, Australia
- **Professor Rico Merkert**  
United States Transportation Research Board Committees: Air Cargo, Aviation Economics
- **Professor Corinne Mulley**  
Partner, Volvo, Educational and Research Foundation Centre of Excellence in Bus Rapid Transit, Chile;  
Executive Board, World Symposium of Transport and Land Use Research (former Chair); Member,  
International Transport Forum (ITF) Working Group on Funding Public Transport (OECD, Paris)
- **Professor John Nelson**  
ITS Australia, Program Committee, Mobility 2024; Member, American Society of Civil Engineers (ASCE)  
MoDaaS Committee (USA); Member, Australasian Transport Research Forum (ATRF) – Public Transport  
Research Committee; Member Australasian Transport Research Forum – Executive Committee and Co-chair  
Public Transport track, ATRF 2024; Member, International Committee, International Symposium on Travel  
Demand Management series; Member, International Conference Series on Competition and Ownership in  
Land Passenger Transport, International Steering Committee.
- **Dr James Reynolds**  
Secretary, ATRF Public Transport Research Committee
- **Professor Geoff Rose**  
Australasian Transport Research Forum: Local Organising Committee, Melbourne, November 2024
- **Dr Rumana Sarker**  
Member, Transportation Research Board Stating Committee on Innovative Public Transport Services &  
Technologies (AP020), 2019-present
- **Professor John Kenneth Stanley**  
Member, Advisory Committee, Institute of Transport Studies, Monash University, Australia, 1995 - present.
- **Dr Susi Susilawati**  
United States Transportation Research Board Committees: Geographic Information Science and Applications  
(Friend); United States Transportation Research Board Committees: Urban Transportation Data and  
Information Systems (Friend); Indonesia: International Symposium on Transportation Studies for Developing  
Countries
- **Professor Hai L. Vu**  
United States Transportation Research Board Committees: Artificial Intelligence and Advanced Computing  
Applications: ABJ70 (Member), ACM, JSAT  
Member, IEEE ITS

# Awards and Honours

- **ITLS**
  - ShanghaiRanking League Table: Transportation Science and Technology (incorporating the work of ITLS) announced as the highest ranked research area at the University of Sydney (8<sup>th</sup> Globally).
- **Professor Matthew Beck, ITLS**
  - USS Award for Teaching ITLS6002 (Semester 1, 2024), University of Sydney Business School
- **Professor Michael Bell, ITLS**
  - USS Award for Teaching ITLS6300 (Semester 1, 2024), University of Sydney Business School
  - Google Scholar h-index of 70
- **Professor Michiel Bliemer, ITLS**
  - USS Award for Teaching ITLS6102 (Semester 2, 2023), University of Sydney Business School
  - USS Award for Teaching ITLS5100 (Semester 2, 2023), University of Sydney Business School
  - USS Award for Teaching ITLS5100 (Semester 2, 2024), University of Sydney Business School
- **Dr Jyoti Bhattacharjya, ITLS**
  - USS Award for Teaching ITLS6010 (Semester 2, 2023), University of Sydney Business School
  - USS Award for Teaching ITLS6010 (Semester 1, 2024), University of Sydney Business School
- **Dr Geoffrey Clifton, ITLS**
  - USS Award for Teaching ITLS5050 (Semester 2, 2023), University of Sydney Business School
- **Associate Professor Alexa Delbosc, ITS**
  - Monash University nominee for the Australian Council of Graduate Research Excellence in Graduate Research Leadership award
- **Professor Ben Fahimnia, ITLS**
  - USS Award for Teaching ITLS6600 (Semester 1, 2024), University of Sydney Business School
- **Professor David Hensher, ITLS**
  - Excellence in Research Award (E), University of Sydney Business School
  - Highly cited academic, Academic Ranking of World Universities (ARWU)
  - The Australian 2025 Research Magazine: Top Researcher in Transportation
- **Dr Chinh Ho, ITLS**
  - USS Award for Teaching ITLS6111 (Semester 1, 2024), University of Sydney Business School
- **John Rose, ITLS**
  - Google Scholar Citation Milestone of 25,000+
- **Dr Nan Zhen, ITS**
  - Department Postgraduate Graduate Research Supervision Award

## **Industry Sponsored PhD Scholarships - Monash**

### **IP-GRIP Program (Bus Association Victoria)**

Ha Anh Nguyen

Exploring the Safety Impacts of Bus Asset Ownership Models

### **AI-based traffic monitoring in mixed non-lane-based traffic environment**

Minh Nguyen

## **Industry Sponsored PhD Scholarships – University of Sydney**

### **Thales**

Syed Mujtaba Hussain

An empirical analysis of drone ecosystems in 4PL logistics involving warehouse and last-mile delivery operations

### **Air New Zealand**

David Li

Adopting blockchain technology for enhancing airline sustainability and supply chain/customer confidence



## Centre Outputs

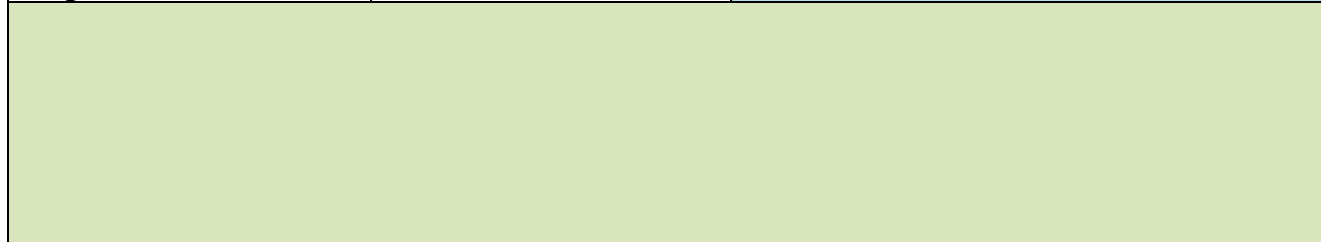


**Australian Government**

**Australian Research Council**  
***ARC Centres of Excellence***

Centre Outputs and Detailed Income and Expenditure  
Report  
(CODIE)

Centre Name:		ARC Centre of Excellence of Teaching and Research in Transport Management
Centre ID: (eg CE1100006)		NO95/08214
Calendar Year Reported:		2024
Centre Admin. Organisation:		The University of Sydney





## CENTRE OUTPUTS AND DETAILED INCOME AND EXPENDITURE REPORT (CODIE) GUIDE

CODIE data from individual Centres is for use within the ARC and will not be published. Consolidated figures may be published, used for evaluation purposes or to promote the overall achievements and/or outcomes of the ARC Centres.

The ARC is interested in tracking the development of the Centre as a focal point for research and as an attractive destination for high-quality researchers. The Outputs categories align Centre outputs with the outputs of other ARC schemes.

### Reporting requirements

- Centres **receiving** ARC centre funding must submit a completed CODIE (Certification, Outputs, Income, Expenditure, In kind, Personnel and Other ARC grants worksheets) along with five (5) copies of the Annual Report
- Centres **no longer receiving** ARC centre funding, but retaining their title, must submit a completed Outputs worksheet only from this CODIE along with one (1) copy of the Annual Report.

### To be noted when completing the CODIE:

- The CODIE is NOT a balance sheet. The total income does not necessarily have to balance the total expenditure.
- Headings should not be modified. New headings must only be entered under the "Other" category.
- Leave blank any rows that are not applicable to your Centre.
- New rows may be added to tables if more entries are required.
- All data must be for the 2024 calendar year ONLY.
- Insert Centre Details on sheet 1 (Title Page) before completing the remainder of the CODIE. These details will auto-fill across the worksheet.
- Example worksheets are provided. Please note the data in these examples are illustrative only and do not represent indicative amounts.

### Submitting your CODIE (due by 31 March each year)

To submit your CODIE please:

- Check the Centre name below is correct.
- Print this page and sign the Certification below.
- Print one (1) copy of each worksheet.
- Post this with the signed Certification page and five (5) paper copies (one for Centres no longer receiving ARC Centre funding) of the Centre's Annual Report to:

Centres Coordinator  
Australian Research Council  
GPO Box 2702  
Canberra ACT 2601

- [Email an electronic copy of this file to centres@arc.gov.au](mailto:centres@arc.gov.au)

### Certification

To be signed by an authorised officer of the Centre.

I hereby certify that the following sheets are an accurate representation of the outputs, income and expenditure of the:

ARC Centre of Excellence of Teaching and  
Research in Transport Management

covering the calendar year 2024 and that I am authorised to approve their submission.

Certified by:

Signature



Print Name

Professor David Hensher

March 2025

**Instructions**

- **Include outputs for ALL Centre activities (including those arising from Centre staff not named as Cis or PIs).**
- **Do not include any outputs from other ARC-funded projects or from work predominately completed before commencement of the Centre.**
- **If you are unable to differentiate between Centre outputs from other ARC-funded projects, these may be included in Column A. In these cases, the (double counted) outputs should also be acknowledged in Column D.**
- **Include only 2023 accepted and in-print books/articles. Do not include outputs that were listed in the 2023 CODIE.**

Code	Type of Output	A Number of Centre outputs	B Number of outputs in Column A that included overseas involvement (i)	C Number of outputs in Column A that involved personnel external to the Centre (ii)	D Number of outputs in Column A also attributed as outputs of other ARC Projects (iii)
A1	Book – authored research	1	0	1	0
A2	Book – authored other	0	0	0	0
A3	Book – edited	0	0	0	0
A4i	Book – revision/new edition	0	0	0	0
A4	Book - translation	0	0	0	0
B	Book chapter	6	1	0	0
C1	Journal article – articles in scholarly refereed journal	94	46	57	1
C2	Journal article – other contribution to refereed journal	1	1	1	0
C3	Journal article – non-refereed article	0	0	0	0
C4	Journal articles – letter or note	0	0	0	0
C5	Unpublished reports (including commercial consultancies)	2	0	0	0
D	Major review	0	0	0	0
E1	Conference – full written paper-refereed proceedings	37	13	21	2
E2	Conference – full written paper-non-refereed proceedings	0	0	0	0
E3	Conference – extract of paper	2	1	1	0
E4i	Conference – edited volume of conference proceedings	0	0	0	0
E4	Conference – unpublished presentation	0	0	0	0
F	Audio-visual recording	0	0	0	0
G	Computer software (including digital maps, data, web outputs)	0	0	0	0
H	Designs	0	0	0	0
H2	Technical drawings	0	0	0	0
I	Patents - filed	0	0	0	0
I2	Patents - pending	0	0	0	0
J1i	Other creative works – major written or recorded work	0	0	0	0
J2i	Other creative works – minor written or recorded work	0	0	0	0
J3i	Other creative works – individual exhibition or original art	0	0	0	0
J4i	Other creative works – representation of original art	0	0	0	0
J1	Major creative works	0	0	0	0
J2	Creative work including in group exhibition, performance, recording or anthology	0	0	0	0
J3	Exhibition curatorship	0	0	0	0
K	Number of national collaborating institutions (iv)	7/11	0	0	0
L	Number of international collaborating institutions	31/25	0	0	0
M	Number of countries involved in collaboration	17/16	0	0	0
N	Number of countries from which international visitors originated	6/9	0	0	0
O	Number of international visitors	6/9	0	0	0
P	Number of overseas visits by Centre personnel	12/20	0	0	0
Q	Number of countries visited by Centre personnel	7/11	0	0	0
R1i	Training programs/teaching packages conducted	7/3	0	0	0
R1	Number of PhD students graduated	7/4	2	0	0
R2	Number of Masters students graduated	133/2	0	0	0
R3	Number of Honours students graduated	N/A	0	0	0
S1	Number of PhD students enrolled	24/41	14/20	0	0
S2	Number of Master students enrolled	344/123	260/49	0	0
S3	Number of Honours students enrolled	N/A	0	0	0
T	Number of early career researchers (within 5 years of PhD completion)	3/3	1/3	0	0

- (i) Outputs with overseas involvement – e.g., #journal articles with international co-authors, # international students enrolled/graduated  
(ii) Outputs with involvement from outside the Centre – e.g. # journal articles with co-authors not affiliated with the Centre  
(iii) Outputs which have been attributed elsewhere in ARC reporting, - e.g. Linkage Project final reports  
(iv) Codes K-Q = Sydney/Monash