La Trobe University

Research Impact for Sustainable Development Report 2024

This report was prepared by the Research Impact Team with assistance from the La Trobe research community. *For queries or corrections please contact* *impact@latrobe.edu.au*

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Acknowledgement of Country

La Trobe acknowledges that our campuses are located on the unceded lands of many traditional custodians in Victoria and NSW. We recognise their ongoing connection to the land and value their unique contribution to the University and wider Australian society.

La Trobe University is committed to providing opportunities for Aboriginal and Torres Strait Islander people, both as individuals and for communities, through learning and teaching, research and community partnerships across all our campuses.

We pay our respects to Elders past and present and thank them for their ongoing care of the land, skies, and waterways of this beautiful country.

We acknowledge our Indigenous staff for their valuable contributions, dedication and ongoing support of our strategic objectives.

FOREWORD: IMPACT AT LA TROBE

Research Impact Strategy

La Trobe's approach to impact derives from the University strategy *Research & Innovation 2030*, refreshed in 2024. Our priorities include aligning our research with the UN Sustainable Development Goals and ensuring that we meet the needs of industry, government and community partners. Recognising that global impact begins on a local level, we are proud of our achievements in regional Victoria as well as internationally. Our impact strategy, along with the latest impact stories, can be found on our website.

Pathways to impact in 2024

2024 saw the formal launch of LISAF – the La Trobe Institute of Sustainable Food and Agriculture – and ACAMI, the Australian Centre for AI in Medical Innovation. We were also successful in securing two ARC Industrial Transformation Hubs (Protected Cropping and Molecular Biosensors). Also launched in 2024 were our new Bio Innovation Hub, which collocates industry partners in biotech, and the La Trobe Private Hospital in partnership with Healthscope.

A note on our data

In 2024, La Trobe launched a custom-designed impact tracking module in our central research management platform, PRIME. This enables impact and pathways to impact to be tracked for every project recorded in PRIME. As well as narratives, PRIME captures structured data including:

- Geographical reach
- Sustainable Development Goals
- Impact types
- Impact indicators.

There are currently over 1000 projects registered for impact tracking, representing all academic Schools and fields of research.

The narratives collected in this report are all categorised either as **"case studies"** – focusing on instances of impact realised in 2024 – or as **"pathways to impact"**, which focus on dynamic engagement with our partners and communities.


PATHWAYS AND IMPACT IN 2024
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MAR
Bec Strating partners with the Australian Government to present and convene the Maritime Cooperation Forum at the 2024 ASEAN-Australia Special Summit (see p. 29)
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8 DECENT WORK AND ECONOMIC GROWTH
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2 ZERO HUNGER
DEC
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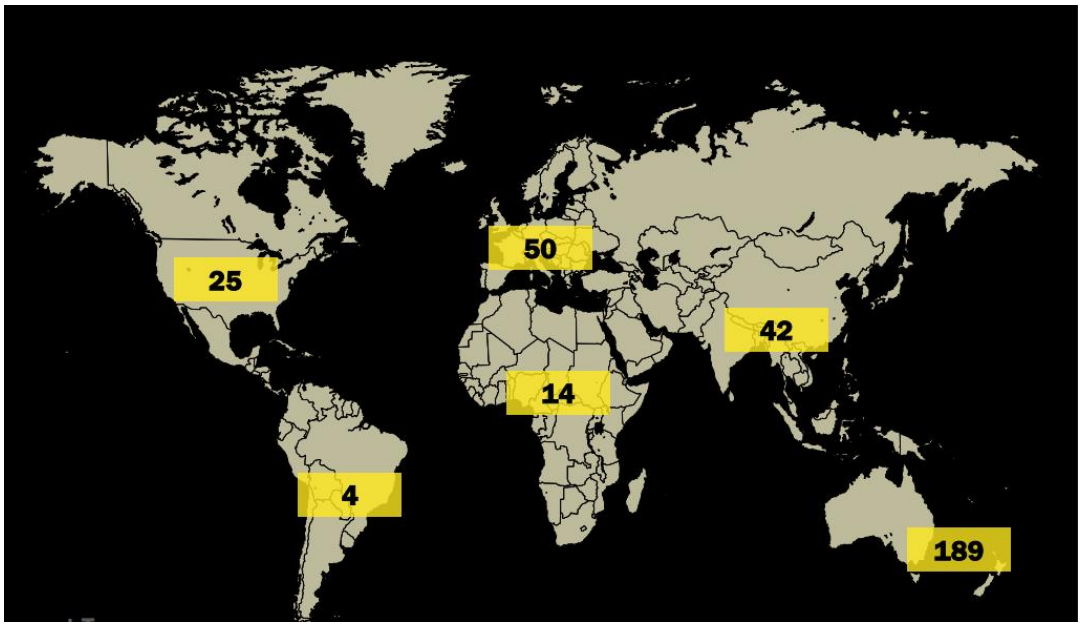
3 GOOD HEALTH AND WELL-BEING
DEC
Following lobbying from Lindsay Carey and collaborators, the American Psychiatric Association update DSM Z - Code 65.8 to include 'Moral problems' (see p. 10)

GEOGRAPHICAL REACH

La Trobe's research is making a difference in over 40 countries globally.



Projects per continent

WORLD LEADING IN SUSTAINABLE DEVELOPMENT

In the 2025 Times Higher Education (THE) Impact Rankings, which assessed activity in 2024, we were ranked:

First in Australia and in the top 20 in the World for SDG2 Zero Hunger

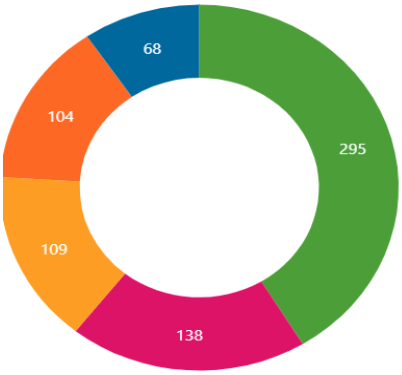
7th in Australia and in the top 30 in the World for SDG3 Good Health and Wellbeing

In the top 50 in the World for SDG5 Gender Equality

In the top 60 in the World for SDG6 Clean Water and Sanitation

TOP SUSTAINABLE DEVELOPMENT GOALS

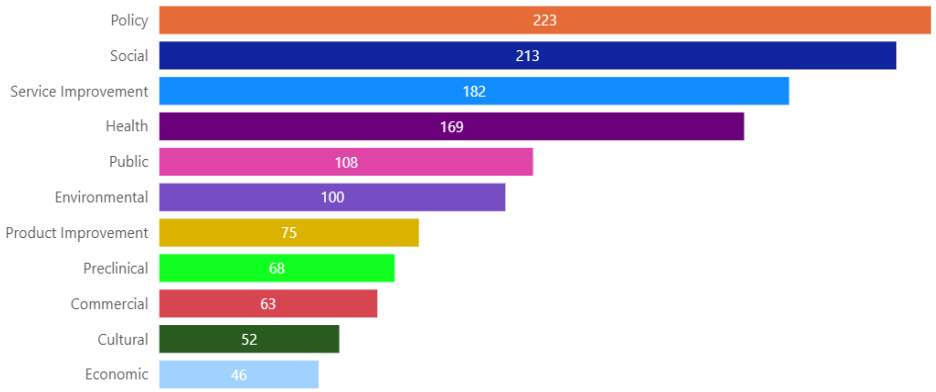
Data from our research management platform shows our contribution is most evident in:



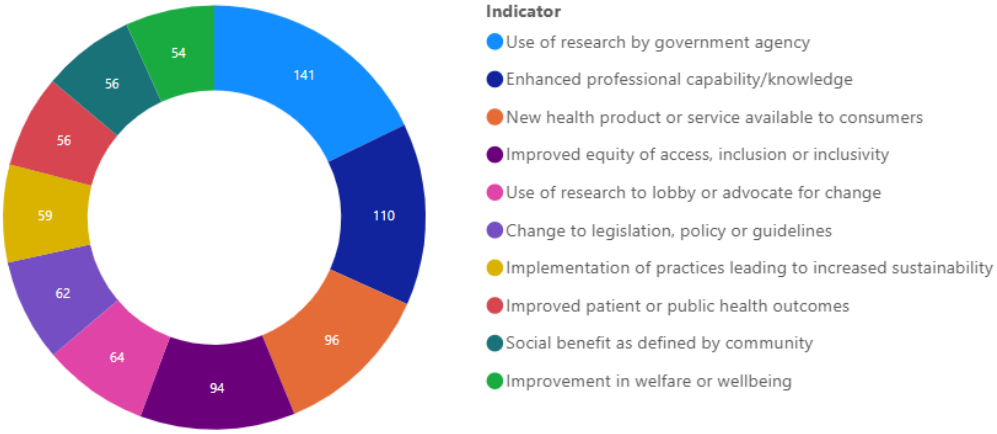
The SDGs with the greatest number of impact records in our database

TYPES OF IMPACT

Our research makes a difference across many different areas of society. Our greatest impact has been in policy change, social wellbeing, improvements to services, and health.



Our top 10 indicators of impact are:



NO POVERTY

Case study:

Warlpiri Education and Training Trust

The Warlpiri Education and Training Trust (WETT) is a community development project governed and funded by Indigenous people in the Tanami Desert, Central Australia. A portion of gold mining royalties have been directed to WETT to be used to strengthen education and training in the Warlpiri communities of Lajamanu, Yuendumu, Willowra and Nyirripi. Since 2005, WETT has invested over $53m into initiatives such as Warlpiri language-learning, adult literacy, and youth activities.

In 2019, WETT engaged a team of researchers from La Trobe's Centre for Human Security & Social Change (CHSSC) to assist in developing a framework to monitor and evaluate their community-led programs. This partnership built on La Trobe's long-term collaboration with the Central Land Council, which has a similar responsibility for distributing funds for Indigenous program funding. The CHSSC team worked with WETT to develop and test **an evaluation framework meaningful to the community**, which is now being used to track progress and communicate achievements.

The community-led approach fundamental to this partnership empowers Indigenous governance by co-creating a language and method for understanding "progress" that recognises culturally appropriate indices of value. The *Yitakimaninjaku, warrirninjaku, payirninjaku manu pina-jarrinjaku* ('Tracking and Learning Map') includes factors such as respectful relationships, strong decision-making, and involving young people. In sharing their stories with a wider audience, WETT has gained national recognition, including winning the NAIDOC Week Award for Education in 2024.

Case study:

Roadmap to address Pacific Island debanking

International banks have been terminating correspondent banking relationships (CBRs) with Pacific Island nations, in part due to concerns about money laundering, terrorist financing and corruption risks. CBRs are vital, as they enable cross-border payments. Some nations have lost their last CBR and have been cut off from the international financial system. The loss of these relationships has adverse consequences for international trade, undermines the ability of seasonal and migrant workers abroad to remit money to their families, and damages social and economic development.

The Pacific Islands Forum (PIF) requested the World Bank to prepare a report on CBR terminations in the Pacific and recommendations on how to improve the situation. The team of authors included La Trobe Law School's Nicholas Morris, Sue Jaffer and Louis de Koker. In order to support the PIF's implementation of the report's recommendations with immediate effect, the World Bank developed a CBR Roadmap to reconnect Pacific Island states with the global banking network. The Roadmap has been kickstarted by an initial **World Bank investment of USD $68m** in credit and grant funding, providing short-term relief and supporting the implementation of the Roadmap to provide long-term solutions.

ZERO HUNGER

Pathway to impact:

Sustainable management of an invasive weed

Gazanias are a prolific introduced weed and highly invasive. They grow in thick mats, stressing, suppressing and competing with crops and native vegetation for space, light, water and nutrients. Currently there is no selective chemical herbicide that has been registered and approved for use on Gazanias in Australia. Most existing broad-spectrum herbicides applied to control other weeds are ineffective on established Gazania plants.

In 2024, with funding from the Grains Research and Development Corporation (GRDC), La Trobe's Ali Bajwa carried out physical surveys to identify Gazania hotspots, and in consultation with agronomists and chemical companies, identified a list of potential candidates for chemical control which were tested in glass house trials at La Trobe. These glass house trials created a shortlist of **chemical control candidates** which are now being tested in collaboration with growers in field trials in Loxton and Arno Bay in South Australia on sites with Gazania infestation. Survey data and research into how Gazanias spread have provided producers with information concerning the future risk of incursions into grain paddocks while the field trials identify the most effective control approaches.

Case study:

Aglantis smart irrigation system

Manual irrigation systems are labour-intensive for farmers to operate, and misjudging the quantity or timing of irrigation can waste water or cause fertiliser run-off. In partnership with Queensland ag-tech company Aglantis, a team led by La Trobe's Prof. Wei Xiang have developed a smart irrigation system which uses AI to monitor factors such as temperature, humidity and seasonal weather patterns and optimises the operation of water pumps accordingly.

Aglantis successfully installed the purpose-built system on an 80-hectare sugarcane farm near Townsville. Saving on cost, time and resources, smart irrigation **'takes the guesswork out of farming'** according to Aglantis' managing director, Luke Malan. Aglantis formally launched their smart irrigation system in December 2024; the first time such a system has been commercialised in Australia.

Case study:

Diagnosing viruses in vegetable crops

A PhD study undertaken by Dr Joanne Mackie (La Trobe / AgriBio) has produced diagnostic and surveillance tools to mitigate the risk of cucumber green mottle mosaic virus (CGMMV) in vegetable crops. Mackie generated 35 high-quality genome sequences of CGMMV using a novel and highly sensitive diagnostic tool which exhibited advantages over the currently available technologies. The sequencing data demonstrated that a single common offshore source of CGMMV is present in Australia, informing the maintenance of **biosecurity policies** for testing and restriction.

The whole-genome diagnostic techniques applied successfully by Mackie to CGMMV were transferred to the development of a similar tool for tomato brown rugose fruit virus (ToBRV), which was used to confirm detection and support tracing of the virus in Victoria and South Australia in 2024 and 2025. Through Agriculture Victoria, Mackie led the national implementation of diagnostics for the ToBRV outbreak.

ZERO HUNGER

Pathway to impact:

Soluble dietary fibre beta-glucan in cereals

Mixed linkage glucan (MLG), a key soluble dietary fibre component found in cereal grain cell walls, has significant health and economic value, yet the molecular processes behind its biosynthesis and regulation are not fully defined. In collaboration with the James Hutton Institute (UK) and the University of Virginia (USA), La Trobe's Assoc. Prof. Monika Doblin is uncovering the molecular mechanism responsible for the synthesis and regulation of MLG in cereal grains.

By **advancing our understanding of MLG biosynthesis**, the project paves the way for the development of next-generation cereal grains that are tailored for both agronomic performance and nutritional value. Grains with increased levels of soluble dietary fibre offer a unique value proposition for growers, providing new avenues for market differentiation and premium products. Meanwhile, improving the nutritional profile of staple grains offers a cost-effective strategy to combat diet-related health issues and reduce the growing burden on the national healthcare system.

The project has already yielded critical insights into the biochemical pathways controlling MLG levels and structure. These discoveries lay the foundation for future breeding and biotechnological efforts aimed at increasing the dietary fibre content in cereals, delivering long-term benefits for growers, processors, and consumers alike.

Pathway to impact:

Nutrient symbiosis for agriculture

To feed a growing global population, we need to increase the sustainability of farming systems. Nitrogen is fundamental to crop growth, but much of the nitrogen required by cropping systems is provided by industrially produced fertilizers, the use of which is not only environmentally unsustainable, but also out of reach for many farmers in the developing world who cannot access or afford them.

ENSA - Enabling Nutrient Symbioses for Agriculture – is a US$35 million international project funded by Gates Ag One aimed at using biological nitrogen fixation to sustainably **increase crop yields** for small-holder farmers in Africa. The project team includes La Trobe researcher Dugald Reid who is investigating the ways in which legumes interact with soil bacteria to convert nitrogen into usable nutrients. This process of nitrogen fixation is reduced or halted when nitrogen levels in the soil are already high, but in June 2024, Reid and his ENSA collaborators published research in Nature which reported the discovery for the first time of the genetic off switch that controls the shutdown of this process. The gene, known as "Fixation Under Nitrate" (FUN), was discovered after screening 150,000 individual legume plants.

The discovery has allowed the research team to now remove the gene in legume crops using CRISPR gene-editing techniques so that they continue to fix nitrogen.

As Reid explains, 'continued nitrogen fixation could be a beneficial trait that increases nitrogen availability, both for the legume and for future crops that rely on the nitrogen left behind in the soil after legumes are grown… This helps lay the foundations for future research that provides new ways for us to manage our farming systems to reduce nitrogen fertiliser use, increase farm incomes and reduce the impact of nitrogen fertiliser use on the environment'. The current goal of the ENSA project is to move this technology to multi location field trials in soybean and cowpea. Translation into fava beans is also being supported by the N2CROP project.

GOOD HEALTH & WELLBEING

Case study:

PozQoL: valuing quality of life among people living with HIV

Successful treatments have transformed HIV into a chronic condition. However, improving quality of life is also essential for successful health outcomes and has been prioritised by the Australian National HIV Strategy as well as globally. Treatment for HIV therefore extends to non-medical interventions such as peer programs, community and welfare services, and HIV policy. But to measure the impact of these interventions requires a scale which is scientifically robust, practical for use in a clinical setting, and seen as relevant by those living with HIV. La Trobe researcher Graham Brown led a team from La Trobe's Australia Research Centre in Sex, Health and Society (ARCSHS), in partnership with the National Association of People Living with HIV Australia and with support from ViiV Healthcare, to co-develop PozQoL, a validated quality of life measurement scale designed for and by people living with HIV.

PozQoL

Valuing quality of life among people with HIV

Read about how people have benefitted from using PozQoL across the world https://www.pozqol.org/pozqol-stories/

Free to use, PozQoL is unique in its wide-ranging adoption across clinical, research, policy and community settings as a client reported measure to assess and engage with patients, in research studies and clinical trials, and by community and peer organisations to measure and track the quality of life of HIV-positive clients. As a result of its development, Australia is now one of the only countries in the world to include a quality-of-life target in its National HIV Strategy, and this target is measured against data collected through ARCSHS' HIV Futures survey series using the PozQoL scale.

The scale has been translated into 30 languages and has been used in clinical research in 11 countries, as well as in community services and clinics across Australia.

Case study:

Extending access to aphasia therapy

The NHMRC COMPARE study (2015-2020) led by La Trobe's Prof. Miranda Rose found Multi-modality Aphasia Therapy (M-MAT) to be more effective than standard care. M-MAT includes other forms of communication such as drawing, writing or gesture and is delivered in a high dose/high intensity format. The results have been shared in over 20 locations worldwide and M-MAT is recommended in international clinical guidelines, with several countries now conducting their own trials.

In 2024, Prof. Miranda Rose was recognised with the international Robin Tavistock Award for her contribution to aphasia recovery.

To reach consumers with limited access to aphasia rehabilitation services, Rose and her team, led by Postdoctoral Fellow Dr John Pierce, are now extending M-MAT into a telehealth platform allowing people with aphasia to receive the therapy remotely. Funded by the MRFF and co-designed with clinicians and people living with aphasia, M-MAT Tele is currently being trialled in Australia. Evidence to date shows feasibility and acceptability of the platform with clinical outcomes similar to the face-to-face version.

People with aphasia who are from culturally and linguistically diverse backgrounds face additional disadvantages. Language therapy resources in languages other than English are extremely limited. La Trobe's Dr John Pierce has developed a free, online aphasia therapy website, operational since 2013, which allows people to access language therapy for aphasia at no cost, on any device, in multiple languages. **In 2024, it was used by over 63,000 people from 162 different countries in 10 different languages**, with the recent addition of Greek, Vietnamese and Mandarin. Its content and interface have been commended by users and therapists alike.

GOOD HEALTH & WELLBEING

Case study:

Minimum price legislation for alcohol

La Trobe researcher Sarah Callinan – a member of the Centre for Alcohol Policy Research - is study director of the Australian arm of the International Alcohol Control study, the first international cohort study which measures the status and impacts of national or state level alcohol control policies and provides a monitoring tool for measurement of change over time. A focus of Callinan's research has been on understanding how price policies will affect alcohol consumption among different types of drinkers (levels of drinking and income), and across different types of alcohol and settings (on-and off-premises).

Her research on alcohol pricing informed the introduction of new minimum price legislation in Wales and the Northern Territory, and has been cited in policy and guideline recommendations for unit pricing produced by the IMF, Public Health Scotland, the European Commission, and the WHO.

Callinan's research into alcohol home delivery informed policy changes in NSW, and she is also developing a research base to address the conceptual and empirical issues in current psychometric approaches to measuring risky behaviours which can be used to develop an improved measure in the future.

Case study:

Moral Injury Skills Training

In 2024, Assoc. Prof. Lindsay Carey was awarded the ***Conspicuous Service Medal*** *(CSM) by the Governor General for his outstanding collaborative development of resources and training towards suicide prevention among veterans.*

The Moral Injury Skills Training (MIST) and Pastoral Narrative Disclosure (PND) strategy was developed in recognition that current definitions and treatments of PTSD for defence personnel and veterans do not always address the full impact of combat trauma, particularly that which leads to suicide. Assoc. Prof. Carey and Dr Timothy Hodgson demonstrated that many veterans are also affected by moral injury, or a breakdown of ethical values resulting from transgressions witnessed or perpetrated in life-or-death situations.

In 2022, the Australian Department of Defence commissioned a "Moral Injury Skills Training" (MIST) program for chaplains of all denominations across Navy, Army and Air Force services. MIST training is now mandatory for all ADF chaplains and the full course has so far been completed by 250 military chaplains In 2023, MIST was rolled out beyond Defence to Australian emergency services with **over 70 health and welfare chaplains having now completed MIST**. Internationally, he UK military approved 65 chaplains to undertake the MIST training and Carey has collaborated on a "Moral Injury Handbook for Military Chaplains" and a self-help guide about moral injury for distribution across the US armed forces.

During 2024, Carey and collaborators in the USA lobbied the American Psychiatric Association committee for the addition of moral injury to the Diagnostic Statistical Manual of Mental Health Disorders. In December 2024, the **DSM Z-Code 65.8 was officially approved to include 'Moral problems'** - decisively distinct from PTSD.

GOOD HEALTH & WELLBEING

Pathway to impact:

Rural Health Consumer Panel

The Rural Health Consumer Panel (RHCP) is a pioneering initiative **empowering rural health consumers to co-design solutions** that meet their healthcare needs. By prioritizing consumer perspectives, the RHCP builds a robust evidence base for rural healthcare, informing policy and practice to drive tangible improvements in health outcomes.

Examples of projects at La Trobe informed by the RHCP include shaping the direction of future research in areas of long COVID (La Trobe Institute for Molecular Science), building AI technology in rural healthcare (School of Psychology and Public Health), exercise interventions in rural people (Holsworth Research Initiative), and a rural telehealth hub in Mildura (John Richards Centre). External bodies utilising the services of the RHCP have included Consumers Health Forum of Australia, National Rural Health Alliance, Victorian Comprehensive Cancer Centre (VCCC) Alliance, National Mental Health Commission, Bendigo Health, Loddon Mallee Public Health Unit, Nexus Primary Health and Grampians Community Health.

Case study:

Care for Complexity in Community Health

Managing multiple chronic health conditions can be challenging, especially for those who lack sufficient resources, capacity, or social support. Ruth Hardman's industry PhD, undertaken with La Trobe School of Rural Health and Sunraysia Community Health Services (SCHS), resulted in a model of care designed for people experiencing both high treatment burden and low personal capacity. A subsequent Violet Vines Marshman Centre for Rural Health Research partnership grant enabled Dr Hardman to undertake a feasibility trial of this model of care. People with chronic health conditions and complex life demands (social, financial, or psychological) were linked to "care coordinators", healthcare workers trained to provide service navigation and health coaching to build motivation and restore the balance between capacity and life demands.

The 26 clients engaged in the trial reported increased control over health and self-efficacy, improved quality of life scores, and reduction in treatment burden. **SCHS are now revising their models of care** to incorporate trial learnings, including screening for burden/capacity and embedding care coordination more widely. The model complements another SCHS/La Trobe initiative, CP@clinic, with cross-referral and sharing of clients.

Case study:

Community Paramedics

The Australian healthcare system faces an ageing population, high levels of chronic illness, and major healthcare workforce shortages in rural and remote areas. Community Paramedicine (CP), a model which has been successfully adopted overseas, is now being implemented in Australia through La Trobe's Violet Vines Marshman Centre for Rural Health Research.

A ten-month trial of the evidence-based CP@clinic Program ran across 5 clinics in Mildura, Merbein and Red Cliffs servicing 111 people, over one third of whom had no GP. Community Paramedics assessed blood pressure, screened for diabetes, and monitored existing chronic conditions, demonstrating the benefits of CP in managing chronic disease and the potential to reduce pressures on ED attendance and GP appointments.

CP showed particular benefit for the vulnerable and elderly with chronic health conditions and limited access to the health system. CP@clinic drop-ins extended beyond medical advice to build social connections through "community connectors" who worked alongside paramedics to set up walking groups, food relief and community meals. The trial also evidenced benefits for paramedics, alleviating the burnout that results in professional attrition. As a result of the success of the trial, in 2024 the **Federal Government awarded the project a four year $1.4 million** Innovative Model of Care (IMOC) grant to extend its application.

GOOD HEALTH & WELLBEING

Pathway to impact:

Solexan: a new treatment for shingles

Shingles can only currently be treated with oral antivirals, which must be taken in the first three days of symptom onset and reduce only the duration of the illness. Wintermute Biomedical have developed a therapeutic for topical application – Solexan™ – which will act as an adjunctive therapy reducing the severity of symptoms and associated pain.

In 2024, research by La Trobe's Prof. Karla Helbig and Dr Ebony Monson identified the antiviral mechanism operating in Solexan™, which blocks entry of the virus into host cells.
Solexan™ is currently midway through Phase IB clinical trials with promising results, and La Trobe's findings will enable Wintermute to pursue FDA approval for a Phase II trial.

Pathway to impact:

Biomarkers for ME/CFS and long COVID

Myalgic Encephalomyelitis (ME)/Chronic Fatigue Syndrome (CFS) affects approximately 260,000 Australians. Worldwide, studies suggest that 50% of patients with Long COVID – which affects approximately 10% of individuals infected with SARS-CoV-2 - will also meet the criteria for an ME/CFS diagnosis, and the two diseases are clinically similar. But as there is no test to confirm ME/CFS or Long COVID, diagnosis is based on the exclusion of other illnesses. The result is that many patients go for long periods without a clear diagnosis or an informed understanding of their illness. High-profile publications by La Trobe researchers have proposed various biomarkers – measurable biological characteristics – for ME/CFS and Long Covid.
With funding from the Mason Foundation, La Trobe's Sarah Annesley and her team are working on a collaboration with Anna Brooks at the University of Auckland and La Trobe's Lesley Cheng to identify and test the validity of ME/CFS biomarkers across different cohorts. To give these biomarkers greater sensitivity and specificity, Annesley's team is also developing multi biomarker approaches, which include and combine multiple markers across gene expression, immune parameters, micro-RNA, and inflammation.

Pathway to impact:

Clinically relevant models for metastatic breast cancer

Every day, more than eight Australians die from breast cancer. These deaths are due largely to the development of secondary cancers, where cancer cells metastasize (spread) from their original site, growing in another part of the body such as the bone, liver, lung and brain. The translation of basic research into improved therapies for metastatic breast cancer patients requires preclinical murine (mouse) models that are clinically relevant in faithfully reflecting the process of metastasis in humans.

Professor Robin Anderson, co-head of the Cancer Biology and Therapy Program at the Olivia Newton-John Cancer Research Institute (ONJCRI), has developed novel murine models that are unique in the way in which they resemble the pattern of metastatic spread observed in human breast cancer, including some that reflect the very late recurrence of this cancer. These models have been used to identify the genes that regulate the process of metastasis to specific organs, to demonstrate how metastasis can be reduced by blocking the activity of certain genes, to improve immunotherapy for breast cancer and to identify and test new molecular targets and novel anti-metastatic agents for therapeutic intervention.

QUALITY EDUCATION

Case study:

Nexus teacher placement program

Schools in regional areas struggle to recruit and retain good teachers. The Nexus Program, developed by La Trobe University and funded by the Department of Education, is a first-of-its-kind community-led, employment-based pathway to teacher training. It embeds high-performing teachers in schools identified as hard-to-staff, with a particular focus on urban low socio-economic, regional and rural communities. In February 2024, Nexus was announced as the **winner of the "Future Builder" Shaping Australia Award** in recognition of its contribution to addressing teacher shortages in hard-to-staff schools in metropolitan, regional and rural geographic locations. The Victorian Government also committed $2.5m to expanding the program for undergraduates, which will see more than 300 dedicated Education Support staff and Koorie Education Support Officers gain teaching qualifications while undertaking paid employment in schools.

Case study:

Science of Language & Reading (SOLAR) Lab

In June 2024, the Victorian Government announced "Curriculum 2.0", which includes a mandated synthetic phonics approach to reading instruction in the first three years of school informed by research and advocacy on literacy instruction undertaken in La Trobe's School of Education. The Science of Language and Reading (SOLAR) Lab was established by Prof. Pamela Snow and Prof. Tanya Serry in 2020 to promote **evidence-based literacy education** across the school years. To date, over 12,000 participants have completed SOLAR Lab online short-courses on the linguistic and cognitive foundations of reading, including classroom teachers, school literacy leads, principals and allied health clinicians. This initiative has been described in a 2024 peer-reviewed publication. In a separate project, funded by the Bertalli Foundation, SOLAR Lab staff have been collaborating in 2024-25 with Diocese of Ballarat Catholic Education Ltd (DOBCEL) to improve literacy outcomes for children in geographically isolated and disadvantaged primary schools in regional Victoria. Alongside structured literacy instruction, the Aurora Schools Project is now providing specialist training in primary schools whose remote location otherwise makes it difficult for teachers to access professional development. Read more about the SOLAR Lab is helping schools to improve how they teach children to read.

Case study:

Sex education for thousands of schools

The Australian Survey of Secondary Students and Sexual Health (SSASH) is the largest and longest running national survey of school age young people. Funded by the Australian Department of Health and Aged Care, it is carried out by La Trobe's Australian Research Centre in Sex, Health and Society (ARCSHS). The 8th iteration recruited in 2024. It examines young peoples' knowledge about sexual health and practices including STIs, cyberbullying and relationships.

Data from SSASH is used by the Australian Government's Australian Institute of Health and Welfare (AIHW). The website Practical Guide to Love, Sex and Relationships was created to translate the findings from SSASH into action, and includes lesson plans, activities and videos. It receives over 15,000 hits per year. SSASH is included as a resource on the Student Wellbeing Hub, developed by Education Services Australia for the Australian Government Department of Education, and has been recreated as an infographic by the Australian Council for Educational Research (ACER). SSASH also features on the Independent Schools Victoria website where it is described as 'a great resource for parents, schools and policymakers'.

For over 10 years, ARCSHS has worked in partnership with LifeStyles® to develop their sex education portal, providing teaching resources to help educators develop lesson plans and classroom activities, as well as providing free Lifestyles sex-ed kits and products for schools across Australia and New Zealand. The Lifestyles quarterly newsletter developed by La Trobe researcher Alexandra James reaches over 1,000 educator subscribers, and provides timely information and resources on sexual health, STIs and contraception, but also issues related to emotional and social wellbeing, such as consent.

ARCSHS also work in partnership with ElephantEd to review and develop their workshop content to ensure if reflects the latest research and contemporary thinking on sexual health issues. ElephantEd deliver sexual health school workshops to over 500 schools across Australia, reaching hundreds of thousands of students.

GENDER EQUALITY

Case study:

Preventing gender-based violence in Timor-Leste

Gender-based violence (GBV) affects the majority of women in Timor-Leste. Equipping health workers with the skills to recognise, respond to, and document the health impacts of violence is critical to ensuring survivors receive effective care and access to justice, even in the most remote areas. Building on research with survivors of violence and evaluation of a pilot curriculum, an implementing partnership between La Trobe University and the United Nations Population Fund (UNFPA) was developed.

A key milestone was the launch of a national training curriculum for nurses, midwives, doctors, health managers, and specialists at UNFPA-funded "Safe Spaces", which provide GBV survivors with emergency accommodation and onward referrals. Follow-up evaluations conducted in 2024 confirm that this initiative has deepened providers' knowledge and confidence in responding to GBV, with women describing staff as "caring with the heart."

Another major achievement of the initiative is the **integration of GBV data into the national health information system** (HMIS), enabling the Ministry of Health to track incidence and response trends over time. To date, over 685 health providers across 9 municipalities have been trained using the tailored curriculum, job aids, videos, and support model developed through this collaboration, and more than 1,000 survivors have received care.

Case study:

Prevention of sexual violence against women and girls

Sexual violence and harassment (SVH) exist on a spectrum. It can be a single instance, or it can be experienced in various ways across a woman's life. The threat of SVH over a woman's life impacts her mobility and how she navigates within the community, the workplace, and in her family and relationships. Prof. Leesa Hooker leads research to identify effective primary prevention SVH interventions at all levels of the ecological model. Her team developed a Theory of Change to guide the National research agenda to end violence against women and children. Released by the Minister for Women at the 2021 National Women's Safety Summit, this report also informs the current National Action Plan to End Violence against Women and Children 2022-2032.

In 2024, as part of the Action Plan, **the Australian Government Department of Social Services (DSS) invested $7.5m in the delivery of community-led sexual violence prevention pilots** in 9 organisations nationwide. Hooker's team have been engaged by DSS to evaluate the success of these programs.

Case study:

Safe and inclusive sport

It is an uncomfortable fact that gender-based violence occurs in community sports settings. A study led by La Trobe's Kirsty Forsdike with support from Sport & Recreation Victoria and in collaboration with Sports Focus uncovered the pressing need to raise awareness about behaviours in a sports context that players find disrespectful, inappropriate or harmful – from gender stereotyping and transphobia through to instances of assault or abuse.

Five videos showing examples and effects of gender-based violence were developed in collaboration with community sports organisations in regional Victoria, with an emphasis on creating settings and content relevant for local audiences. The campaign was launched in November 2024, and the videos along with accompanying posters have been distributed by partner Sports Focus. The findings of the study have also been used to inform government guidelines, and **Sport & Recreation Victoria have committed a further $100K** to roll out the campaign.

GENDER EQUALITY

Case study:

A Monument of One's Own

Research by La Trobe's Prof. Clare Wright has demonstrated extreme disparity in the commemorative representation of women in public space, leading to the community campaign "A Monument of One's Own". State governments have now begun to address this inequity, for example through the Victorian Women's Public Art program – now in its third year – which has so far commissioned **12 public artworks representing women**. In the past two years, three statues of women have been unveiled in the ACT: Dame Enid Lyons and Dame Dorothy Tangney in 2023, joined in 2024 by Susan Ryan AO. The City of Melbourne has announced that three new statues of women will be built. Prof Wright acted as the Chair of the Council's Statue Advisory Committee. Sydney and Brisbane have declared similar commitments.

Prof Wright has become a prominent media spokesperson on the issue of statue equality. The call for what she has termed 'commemorative justice' has been picked up by Gender Equity Victoria in their broader campaign "Put Her Name On It", which has successfully lobbied for street names and other local infrastructure to acknowledge women's civic contribution. The Her Place Women's History Museum now also offer an interactive map showing places associated with women's historical achievements, including their statues. AMOO also inspired "She Shapes History" walking tours of Canberra with a focus on the capital's queer and women's history. Founder Sita Sargeant is now expanding nationally and launching a companion book. The first statue built in Melbourne by A Monument of One's Own, commemorating equal pay campaigner Zelda D'Aprano, is included in Sita's book and tours.

La Trobe has also received a donation of $15,000 from AndyInc Foundation for research and public engagement purposes to advance AMOO's aim of gender equality in the memorialisation of women's actions, achievements and contributions to civic culture. Prof Wright will be the research lead.

Case study:

The importance of being Oscar

In 2024, the Australian Ballet took on the challenge of representing the life story of Oscar Wilde – author of Dorian Gray, flamboyant aesthete, and victim of a society that did not recognise the legitimacy of same-sex relationships – in what is typically a strictly heteronormative art form. As such, *Oscar* represented an innovative commission for the Australian Ballet, with the potential to attract alternative audience demographics. La Trobe researchers in the history of sexuality were invited to collaborate with the creative team behind Oscar to unpack the context of Wilde's oeuvre and persecution.

A background paper was prepared for the Ballet, which became the basis for the publication of The Importance of Being Oscar. This companion volume contextualised the production through a historically informed queer reading of Wilde's career. Dr Timothy Jones conducted a workshop with the cast and production team, which allowed the dancers to better understand the roles they were portraying. Broadening this consultative role, the La Trobe team took part in a public panel discussion featuring Artistic Director David Hallberg at the State Library of Victoria which was attended by a capacity audience of 200.

'It was through our partnership with La Trobe University that we were able to really dive in deep and become educated about what society was like in the 1890s […] Behind every step in Wheeldon's choreography is a depth of research into the life of Oscar Wilde and what it would have been like to live as a queer man in 1890s London.'

- David Hallberg, Artistic Director Australian Ballet

CLEAN WATER AND SANITATION

Pathway to impact:

A regulatory framework for predicting zinc toxicity in water

Accurate methods for measuring and predicting zinc toxicity in water sources are essential for developing water quality guidelines and for sound environmental management, and must avoid both under-protection (which leads to pollution) and overprotection (which can result in unnecessary costs and burdens for industry). No single value for zinc protects aquatic biota across different water sources, since zinc toxicity is dependent on its bioavailability, which in turn is dependent on the chemical make-up of a particular water source. Currently, the Australian and New Zealand water quality guidelines for zinc account only for the hardness of water, but bioavailability is also influenced by other parameters such as pH and dissolved organic carbon (DOC).

Research led by Jenny Stauber (formerly CSIRO) and Aleicia Holland at La Trobe, in collaboration with numerous partners and funded by the International Zinc Association (IZA), has developed new bioavailability based **models to more appropriately predict toxicity of zinc** and form the basis of updated guideline values and regulatory frameworks in Australian and New Zealand Waters.

A workshop on the derivation and implementation of bioavailability-based water quality guidelines for metals in freshwaters was held in April 2023 in Sydney. Thirty invited scientists, regulators and state/federal government representatives participated in the workshop where the new models were presented and the best method for implementation discussed. This led to a follow-up project in 2024 in collaboration with WCA, the National Institute of Water and Atmospheric Research (NIWA) and WQAdvice, funded by The Metals Environmental Research Associations (MERA), in which a tiered implementation method and training material is being developed.

Pathway to impact:

Using bacteria to improve wastewater management

One of the operational challenges for water treatment plants is the development of huge quantities of overflowing foam on the top of wastewater which becomes a costly biological hazard full of hydrophobic bacteria. Current methods of treating these foaming events are non-targeted and not only kill the bacteria responsible, but also kill off beneficial bacteria required for treating the water and removing excess nutrients.

Three years ago, La Trobe's Assoc. Prof. Steve Petrovski and his group identified and isolated an epiparasitic bacterium, M. amalyticus, with the potential to be used as **a method of biocontrol to stabilise wastewater foam** through targeting and eating the organism responsible for foam generation (published in Nature Microbiology). Surveillance of other treatment plants has identified that this bacterium exists in naturally in many wastewater treatment systems, indicating that it may be a suitable option for foam management.

In 2024, Petrovski and PhD student Jayson Rose identified the mechanism by which M. amalyticus neutralises the bacterium responsible for foaming. Petrovski presented the findings (now published in Nature Communications) at the international Biomolecular Horizons Conference, and the team plan to partner with a wastewater treatment plant for further trials in situ.

DECENT WORK AND ECONOMIC GROWTH

Case study:

Reflective Circles for teachers' wellbeing

The role of teachers has evolved in recent years to incorporate responsibility for student mental health and wellbeing, in addition to academic instruction. This is particularly true in schools with a high proportion of students experiencing socio-economic disadvantage and/or childhood trauma. However, a lack of training and support for teachers themselves has resulted in secondary trauma, isolation, and burnout in teachers. The "Reflective Circles" model of peer supervision for teachers' mental health developed by La Trobe's Dr Anne Southall **successfully improves emotional regulation and wellbeing for participants**.

Online Reflective Circles facilitator training is now being delivered to teachers, psychologists and other school personnel who support teachers with the social and emotional aspects of their work. It has been implemented in ten mainstream and specialist schools across Victoria, and in 2024 is being rolled out to all 22 Edmund Rice Flexi Schools in NSW and Queensland. A Reflective Circles community of practice has also been established. By preventing burnout in educators, Reflective Circles aims to improve teacher retention as well as classroom culture, ultimately making a positive contribution to learning outcomes for all students.

Case study:

Victorian Government Neurodiversity Program

The Neurodiversity Employment Toolkit is a groundbreaking resource designed to help employers create neurodiversity-inclusive workplaces by providing practical guidance on recruiting, supporting, and retaining neurodivergent employees. Developed by La Trobe's Dr Rebecca Flower and Ellen Richardson in partnership with a neurodiverse team at the Victorian Public Sector Commission (VPSC), the toolkit addresses a critical gap in resources for employers seeking to **reduce workplace barriers for neurodivergent individuals**. It provides actionable advice such as how to improve communication, adapt recruitment processes, and design inclusive work environments.

Hosted publicly and freely on the VPSC website, the toolkit is designed to meet the needs of both employers seeking to build their capacity to support neurodivergent staff and employees advocating for workplace adjustments. Many barriers faced by neurodivergent employees, such as unclear position descriptions or onboarding procedures, can be addressed through simple changes that benefit all employees. **To date, the toolkit has been accessed over 20,000 times.**

INDUSTRY, INNOVATION & INFRASTRUCTURE

Case study:

ARC Research Hub in Medicinal Agriculture

ARC MedAg Hub (2019-2024)

The Australian Research Council (ARC) Industrial Transformation Research Hub (ITRH) for Medicinal Agriculture (MedAg Hub) wrapped up in 2024 after five successful years. The aim of the MedAg Hub was to transform the production of high quality, plant derived therapeutics into an integrated, Australia-wide industry.

By bringing together highly skilled academic research expertise, industry knowhow together with state-of-the-art capabilities and infrastructure, the resulting knowledge from the ARC MedAg Hub has led to technical innovation, regional development, and cross-industry applications.

Regional Development and Workforce Upskilling

The MedAg Hub played a pivotal role in securing funding for the **Next Generation Protected Cropping in a Regional Manufacturing Facility** (Next Gen) project. This $10 million initiative, supported by a $5 million grant from the Australian Government Department of Education through the Regional Research Collaboration Program, focuses on research and training in commercial protected cropping systems. Located in regional Victoria with a focus on Mildura, the project utilises protected cropping production expertise, and MedAg Hub experience using medicinal cannabis, to train the future workforce in advanced horticultural production.

In partnership with Cann Group Ltd, the University of Melbourne, SpexAI and Photon Systems Instruments, the Next Gen initiative supports regional capability and provides a **direct pipeline for workforce development** in specialised agricultural production. Through this program we provided support to SuniTAFE in their application for $1.9M from the Victorian State Government to develop a **Cert II in Protected Horticulture**, and expertise in the development and delivery of the course.

Technical innovation

The investment in research infrastructure for the MedAg Hub, and learnings around precision nutrition, crop management, speed breeding, phenotyping and analytical methodologies, were instrumental to establishing the Victorian node of the **Australian Plant Phenomics Network** (APPN) at La Trobe University through a National Collaborative Research Infrastructure grant (NCRIS).

These innovations demonstrate the MedAg Hub's role in embedding high-throughput, data-driven technologies into Australian agriculture and plant sciences, strengthening national research infrastructure.

Cross-industry applications

Building on the MedAg Hub's foundational success, the award to La Trobe in 2024 of an ARC Industrial Transformation Research Hub for Protected Cropping (PC Hub) aims to transform the production of high quality horticultural and medicinal crops into an integrated, national industry that spans primary producers and manufacturers.

Expanding beyond medicinal agriculture, the PC Hub incorporates protected cropping species such as tomatoes, leafy greens and basil, adapting research pipelines originally developed for medicinal cannabis. Furthermore, the PC Hub leverages the national and international networks, technical platforms, multidisciplinary expertise and partnerships built through the MedAg Hub.

The ARC MedAg Hub has laid the groundwork for a new era in Australian agricultural biotechnology. Its influence extends into new research hubs, cutting-edge infrastructure, regional economic development, and a skilled workforce ready to support Australia's growing role in the medicinal agriculture sector.

INDUSTRY, INNOVATION & INFRASTRUCTURE

Pathway to impact:

Improving the diagnosis of breast cancer through NanoMslide technology

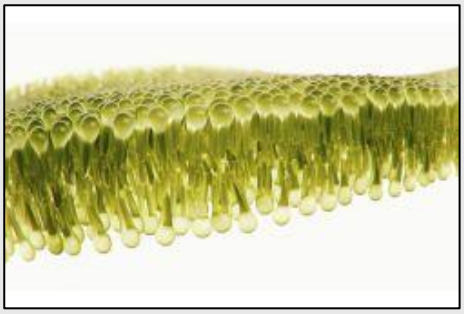
In 2022, Brian Abbey and Eugeniu Balaur published research in Nature demonstrating the ability of 'histoplasmonics' to instantaneously differentiate cancer cells from healthy cells within breast tissue utilizing a conventional optical microscope. The technology, known as NanoMslide, won both the Eureka Prize for the innovative use of technology and the Victoria Prize for Science & Innovation, and in 2023 was spun out into the company AlleSense.

In 2024, a string of international patents for the technology were granted, and AlleSense began the process of acquiring TGA and FDA approval for use in breast cancer diagnosis. Alongside this process of commercialisation, Abbey has also initiated projects to make NanoMslide technology available in rural and remote Indigenous communities. In 2024, La Trobe's ARC Industrial Transformation Research Hub for Molecular Biosensors at Point-of-Use (MOBIUS), led by Conor Hogan, was awarded $4.73m. Through combining the expertise of MOBIUS in saliva-based cancer testing, the capabilities of the NanoMslide as a portable cancer detection platform, and the expertise of La Trobe researchers including Julie Andrews and Kylie Lee in co-designing and implementing health and wellbeing projects with Indigenous communities, the goal is to improve cancer detection by removing the infrastructural inequalities affecting these communities.

Pathway to impact:

Increasing speed and efficiency of lipidomics

Lipidomics involves the use of mass spectrometry to identify and profile the abundance of different lipids – molecular compounds that are central to all of biology. In human plasma, lipid profiling can be used to better understand the relationship between lipid metabolism and genetics and lifestyle factors.



One of the challenges of lipidomic analysis is that comprehensive profiling of the thousands of lipids and lipid sub-classes can be a costly, time and resource intensive endeavour. The Baker Department of Cardiovascular Research, Translation and Implementation at La Trobe features the only high-throughput lipidomic platform in Australia, and has performed some of the largest reported clinical and population lipidomic studies. The methodological approaches developed at the Baker Department are already included as application notes for **liquid chromatography mass spectrometry products** sold by Agilent – a global leader in advanced scientific instrumentation operating in over 110 countries.

The Baker Department are now refining the high throughput methodology to substantially increase its speed and efficiency. A machine learning pipeline and reference library is being developed which will derive the full coverage of the plasma lipidome, from a short, 1-minute sweeping mass spectrometry scan. These new machine learning models will **remove existing limitations on the rate at which samples can be profiled** at scale, allowing a more detailed look into which genes and lifestyle choices impact our overall lipid metabolism the most.

REDUCED INEQUALITIES

Case study:

Best practices for supporting the most disadvantaged job seekers

To effectively place highly disadvantaged jobseekers into employment, particularly those with intellectual and developmental disabilities, remains a challenge for welfare-to-work reforms in Australia and elsewhere. The current Disability Employment Services (DES) model adopts a market-based approach involving engagement of private providers in service delivery and outcome-based payments. Contracted providers are paid an outcome fee for finding and placing jobseekers into employment or organising education and training which prepares them for work. However, evidence indicates that the system does not work well for highly disadvantaged jobseekers who face complex barriers to employment like a disability, as providers are disincentivized to work with these individuals.

Since 2022, Central Victoria Group Training (CVGT) has developed and been trialling a specialist service model known as the Specialist Disability Services Team (SDET), which is based on close links with student, training, educational and community organisations, and the development of personal relationships with jobseekers and individualised support for employers. In 2023, CVGT partnered with La Trobe researcher Phuc Nguyen and University of Melbourne researcher, Mark Considine, to develop the evidence-base for this practice model.

With the current Disability Employment Services (DES) program in the process of re-contracting, findings from the final report (September 2024) provide evidence of how **the person-centred model works to improve employment outcomes** for this group of jobseekers, and how the commissioning framework might be redesigned to reward providers who are willing to engage in potentially more costly but higher quality services for highly disadvantaged clients.

Case study:

National Autism Strategy

In 2020, La Trobe's Olga Tennison Autism Research Centre (OTARC) recommended to the Senate Select Committee on Autism that a National Autism Plan was required, underpinned by a prevalence study to understand the true scope of autism in Australia. The Committee included this recommendation in their final report.

In 2024, OTARC provided the Department of Social Services with a research proposal to undertake an epidemiological study of autism in Australia and contributed to the development of the National Autism Strategy and its associated roadmap. **The Strategy and Roadmap were launched by the Federal Government** early in 2025, along with a $2.8m commitment to the proposed four-year epidemiological study.

Case study:

BBV and STI stigma reduction toolkit

Stigma and discrimination continue to discourage people from seeking testing, treatment and support for blood-borne viruses (BBV) and sexually transmitted infections (STIs). With funding from the Victorian Department of Health, Dr Adrian Farrugia and a team from La Trobe's Australian Research Centre in Sex, Health and Society (ARCSHS) worked with healthcare professionals and community organisations to develop a stigma reduction toolkit for the Victorian BBV and STI healthcare workforce.

The toolkit is listed under the best practice guidelines of the Victorian HIV and Hepatitis Integrated Training and Learning program, and is a listed resource of the Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM). ASHM are currently putting together a GP training module using the ARCSHS website and toolkit. In March 2024, ARCSHS ran a toolkit implementation workshop involving over 100 professionals from Victoria, New South Wales and Queensland.

SUSTAINABLE CITIES AND COMMUNITIES

Case study:

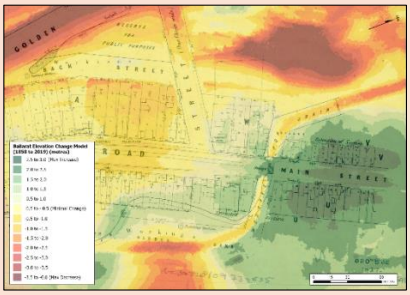
Predicting sites of high archaeological value

La Trobe researcher Greg Hil has developed a method of predicting and identifying sites of likely high archaeological and cultural value by comparing historical elevation data available on historical maps of Melbourne and Ballarat to more recent records of elevation, such as later topographic maps or twenty-first century LiDAR. The models have been used to successfully predict areas of high archaeological potential ahead of new development projects, thereby both avoiding the costs associated with having to halt development works that have already started and improving our ability to identify and preserve sites of cultural value.

'Greg's work has produced a detailed and accurate mapping product which identifies the parts of the city where significant historical archaeological remains are likely to survive. It is used on an almost daily basis to assist with the protection and management of Melbourne's historical archaeology'.

- Jeremy Smith (Principal Archaeologist, Heritage Victoria)

In Ballarat, Hil's elevation modelling was used to identify sites for further investigation through a Ground Penetrating Radar (GPR) survey commissioned by Heritage Victoria.



On the back of this research, the Heritage Council of Victoria provided funding for Heritage Victoria's archaeology team to develop an **Archaeology Management Plan for Ballarat** to identify and list historical archaeological sites. Further historical elevation change modelling has been carried out across Ballarat in 2024, and over 100 new sites of archaeological interest have been registered.

'New technologies such as digital elevation modelling have highlighted that the archaeology is likely to be preserved in outstanding condition across parts of Ballarat, under metres of mining waste'.

- Archaeological Management Plan, Heritage Victoria

Pathway to impact:

Transport technologies to improve accessibility

As a partner in iMove's Cooperative Research Centre (CRC), the Centre for Technology Infusion (CTI) at La Trobe is at the forefront of **applied research into new transport technologies** and transport-related challenges in Australia, with a focus on accelerating technological adoption whilst improving safety, accessibility and governance, and reducing social disadvantage.

The Autonobus, Railway Station Platform Gap Solutions, frictionless ticketing technologies, and Gippsland Community e-bus projects have leveraged new transport technologies to improve transport design and accessibility and reduce social disadvantage for those with a disability, and those in regional, rural and remote areas. The Australian Human Rights Commission has commended La Trobe's work 'in informing the Commission's continued advocacy for greater compliance with, and future improvements to be made to, the DSAPT [Disability Standards for Accessible Public Transport]'.

A partnership with the Asia-Pacific Economic Cooperation (APEC) has provided guidance for policy makers in the Asia-Pacific region to make public transport more accessible. In July 2024, CTI published a best practice guide for policymakers, which has been presented through workshops with APEC members from over 20 different countries.

CTI have also been at the forefront of developing accessibility guidelines for Low and Zero Emission Vehicle (LZEV) charging infrastructure. Austroads - the collective of the Australian and New Zealand transport agencies - are collaborating with CTI and Intelligent Transport Systems (ITS) to develop updated LZEVs charging infrastructure guidelines which respond to the opportunities and challenges for people with disability. In 2024, the draft guidelines were published for consultation.

RESPONSIBLE PRODUCTION AND CONSUMPTION

Case study:

Woolmark Plus: reversing biodiversity loss on woolgrowing farms

Wool farming offers untapped opportunities for environmental restoration. Woolmark, as the global quality assurance authority for wool products, have set out an ambitious **sustainability roadmap for the Australian wool industry**. Its cornerstone is the transition to a nature-positive approach intended to reverse biodiversity loss on woolgrowing farms by 2030.

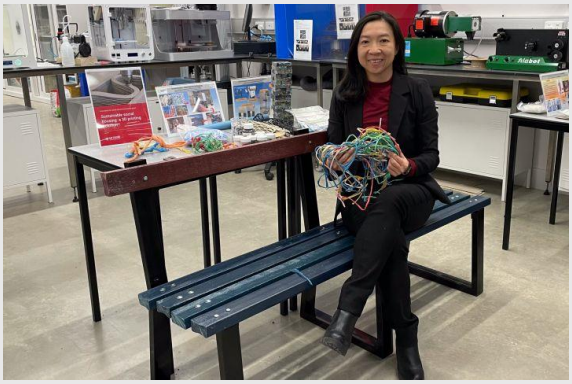
The metrics for setting and tracking this target were developed in collaboration with a team from La Trobe's Research Centre for Future Landscapes. The pilot study resulted in 12 core metrics which include metrics related to greenhouse gas emissions and resource use intensity, pasture condition, and factors indicative of biodiversity such as riverbank health, and coverage and condition of natural habitats. The reliability of these indicators is key to Woolmark's introduction of their Nature Positive labelling, enabling woolgrowers and brands to demonstrate sustainability credentials in national and international markets.

Pathway to impact:

Novel plastic waste recycling technology

With funding from a Circular Economy Markets Fund grant from the Victorian Government (Sustainability Victoria), Associate Professor Ing Kong is investigating how agricultural plastic waste – such as baling twine, nets, covers and fertiliser bags which would otherwise have ended up in landfill, been burnt or processed off-shore - can be effectively recycled locally using Rtec's novel melting technology, and used to generate new products such as fence posts and shipping pallets.
Rtec (Richie Technology) is a Victorian company whose Managing Director Dr William Ritchie studied at La Trobe University. In developing Rtec, Dr Ritchie has participated in both the La Trobe Business Accelerator Program, and the Triggering Innovation Leadership Transformation (TILT) i5.0+ program – an initiative between La Trobe, the Australian National University and the Fraunhofer Institute for Experimental Software Engineering.

Dr Kong is now working to validate the potential of the process and carry out performance trials of the demonstration products using a prototype of the machine in the lab at La Trobe University's Bendigo campus.



Read more about the research in their 2024 publication 'Transforming Bale Twine into Useful Products with an Affordable Melting Machine: Closed-Loop for Recycling Plastics'.

CLIMATE ACTION

Case study:

Parched: Cultures of Drought

Adapting to a changing climate and processing its shocks requires an ability to represent and conceptualise the newly prevalent conditions, such as flood, drought, or unprecedented volatility. For the past four years, La Trobe researchers have been bringing visual artists together with historians and climate scientists in the ARC-funded interdisciplinary collaboration *Parched: Cultures of drought in regional Victoria*. The project revolved around **four artist residencies** – Alvin Darcy Briggs on Yorta Yorta Country, Ponch Hawkes in Bendigo, Jesse Boylan in Albury's MAMA, and Yaseera Moosa in Mildura – and culminated in an exhibition that opened at Bendigo's La Trobe Art Institute in November 2024. Media included video, installation, photography, and found objects.

One objective of the project was to **challenge prevailing images of drought** and instead tap into authentic local histories and experiences. Over 150 visitors attended the exhibition and associated public events, mainly representing regional communities hit hard by recent droughts whose experiences do not often find artistic expression. Moreover, *Parched* provided the participating artists with the opportunity to explore otherwise inaccessible archival material and deepen their own creative practice through scholarly exchange and immersion in affected communities.

Case study:

Predictive models to guide environmental management

Reduced water availability and increases in temperature will cause major changes in the distribution of aquatic, animal and plant species in the Murray Darling Basin (MDB). As part of the Murray Darling Water and Environment Research Program (MD-WERP), La Trobe researcher Michael Shackleton and a team at the Centre for Freshwater Ecosystems have combined contemporary survey records of fish, invertebrate and plant species with information on climate, climate change projections, land-use, catchment physiography and river hydrology to produce a series of maps showing current and future habitat suitability estimates for 32 fish, 123 invertebrates, and 419 plant species throughout the MDB.

This predictive modelling can help inform **prioritisation of basin-scale management decisions** and priority areas for conservation and habitat restoration. Data from the model is feeding into the High Ecological Value Aquatic Ecosystems (HEVAE) framework used by NSW Fisheries and the Department of Primary Industries and Environment (DPIE) and has also been developed into an app which will be available for use by water managers.

Case study:

Climate Change Adaptation Lab

Established in 2023, La Trobe's Climate Change Adaptation Lab (CCAL) focuses on helping government and other organisations adapt policy and practice to cope with the reality of a changing climate, with its unprecedented risks and shocks. In 2024, CCAL collaborated with a number of local governments and Catchment Management Authorities to develop strategies that assess their vulnerability to climate change, build their disaster resilience and reduce longer-term climate change risks. Interstate, this includes supporting Sunshine Coast Council and Noosa City Council to assess the cascading risks of infrastructure collapse triggered by extreme weather events such as the recent Cyclone Alfred.

Following workshops facilitated by CCAL for local authority representatives in NSW and Victoria, participating organisations have gone on to create a network focused on **embedding environmental justice into climate adaptation governance**. The NSW Government has included a focus on the impacts of climate change on workers within its Climate Change Adaptation Action Plan 2025-2029 and the Lab is now advising the government on next steps. The Lab was also the only university involved in producing the second phase of the National Climate Risk Assessment.

LIFE BELOW WATER

Pathway to impact:

3D reconstruction of the Great Barrier Reef

The Australian Institute of Marine Science (AIMS) partners with industry and government to protect Australia's vulnerable coral reef ecosystems. Using advanced AI techniques, La Trobe's Prof. Wei Xiang and Dr Kang Han developed a **photorealistic digital twin of the Great Barrier Reef** for AIMS to conduct detailed simulations of reef conditions.

The algorithms used in the digital twin convert satellite and underwater data into a dynamic model that predicts the effects of disturbances such as bleaching or interventions such as conservation programs. This has provided AIMS with a powerful digital tool for informing policy, environmental and industrial decision-making. AIMS began using Reef-NeRF in 2024 to monitor and model sections of the Reef, evaluating the accuracy of the model by testing its capabilities in the field.

Pathway to impact:

Sensory and bioengineering approaches to predict hearing abilities in fish

Whilst there is increasing concern about the impact of man-made noise on marine life, our limited understanding of the hearing abilities of fish, and of the mechanisms of sound reception in marine invertebrates, make regulatory guidelines about the effects of sound hard to implement.

With funding from the ARC, La Trobe researcher Lucille Chapuis is using high resolution bioimaging and biomechanical modelling to develop 3D images of the hearing structures of elasmobranch fishes (sharks and rays). The biological (biophony), geophysical (geophony) and human-produced (anthrophony) sounds of different 'soundscapes' (open ocean, coral reefs, and coastal temperate environment) will be recorded using underwater recording devices and the variation in the acoustic traits of these soundscapes will be identified and analysed using artificial intelligence. Soundscape features will then be compared to the hearing structures of different species, allowing the development of a model which can be used for the first time to predict the sensitivity and hearing abilities of different taxa, providing policy makers and conservatory bodies with a framework for **understanding the potential effects of noise pollution** on different species.

Alongside this model, Chapuis is also developing a low-cost, user-friendly, modular underwater sound recording device. One of the barriers to underwater acoustic research is the high cost and complexity of current hydrophone technology which limits its accessibility, particularly in low-income regions and for educational or citizen science contexts. To address these barriers, Chapuis and her collaborators are aiming to develop a **high-quality, calibrated hydrophone system** priced under $200 which will enable widespread use by educational institutions, conservation organisations, and community scientists.

LIFE ON LAND

Case study:

Great Australian Wildlife Search

A team at L Trobe's Centre for Freshwater Ecosystems, led by Dr Michael Shackleton, have used modelling and probability sampling to identify and generate maps of sampling sites for the annual citizen science project the Great Australian Wildlife Search (GAWS). GAWS is part of the Basin Condition Monitoring Program, a commitment by the Australian Government to advance and implement new methods for monitoring and reporting on the economic, social, cultural, and environmental conditions in the Basin.

The project involves the collection of eDNA (environmental DNA, taken from the surrounding environment rather than the organism itself) by citizen scientists from water samples across the Murray Darling Basin (MDB). Citizen science projects such as these are critical for reducing overall project costs and engaging the community on river health and conservation issues. But in order to be successful, participants and volunteers need to be directed where to look to ensure that the sampling is representative in terms of biodiversity values and distribution, but also that sites can be easily accessed.

The La Trobe team developed a rigorous sampling methodology to ensure a representative sample across the states, identifying sampling sites across the MDB in South Australia, New South Wales, Victoria and Queensland (as documented in the June 2024 report and on the GAWS website - see 'How are the sites selected' FAQ).

The eDNA analysis successfully identified 17 threatened and 26 invasive species across the basin and will help to inform future conservation efforts.

Case study:

Soil monitoring for ecosystem restoration and carbon offset

Led by Dr. Jennifer Wood, La Trobe researchers are collaborating with Greenfleet and the Darebin Creek Management Committee (DCMC) on a decade-long project to monitor soil microbiology and carbon dynamics during ecosystem restoration. The project builds a long-term dataset to track changes in soil health and validate predictive models for carbon offsetting.

Soil samples are collected annually from Greenfleet's Glendalough native revegetation project and DCMC's community-led revegetation site in Kingsbury.

Data such as soil carbon and microbial analysis are integrated into undergraduate courses at La Trobe**.** Insights from the 2023 soil microbiome report have already led to an **improved value in site condition** as measured through the standards for ecological restoration recovery wheel. These findings have also shaped management practices, with the cessation of further mulching to improve ecosystem function at DCMCs site.

Greenfleet is an environmental not-for-profit organisation that restores native, biodiverse forests across Australia and New Zealand. Through their research, Dr. Wood's team has developed a practical hand-sampling protocol to complement existing guidelines and improve site-specific carbon monitoring. The collaboration aims to refine restoration monitoring practices and improve industry-relevant carbon assessment techniques, supporting evidence-based approaches to ecosystem restoration and carbon sequestration.

LIFE ON LAND

Case study:

Genetic Solutions to Minimise Methane Emissions

The largest source of greenhouse gases on a dairy farm is enteric methane emissions (EME) - methane produced during fermentation of feed in ruminants – which accounts for approximately 60% of total farm emissions. One of the key management tools for reducing EME is genetic selection: breeding for lower emissions. La Trobe researchers Prof. Jennie Pryce and Dr Caeli Richardson, in partnership with DataGene, Agriculture Victoria Research, Dairy Australia, and the Gardiner Dairy Foundation, developed and implemented a Sustainability Index in the Australian national breeding program, including predictors of methane, which allows farmers to make conscious breeding decisions to reduce the environmental impact of dairy cattle whilst balancing genetic progress in other valuable traits such as production, health, and fertility.

In further research, Pryce and Boris Sepulveda – as part of his 2024 Nancy Millis award winning PhD - have conducted a comprehensive analysis of host genetics, rumen microbiome, and EME in 834 dairy cattle from Australia and Spain to determine the extent to which the microbiome explains EME variance.

Identifying the key genetic and microbial determinants of methane emissions provides critical insights that can be used to identify core rumen microbiome features for targeted selective breeding programs.

As a result of Sepulveda's work, Agriculture Victoria have been invited as a research partner in a Global Methane Hub funded research project to use metagenome to drive down methane emissions. In April 2025, a partnership between the Global Methane Hub and the Bezos Earth Hub was announced, with an additional $4 million to support rumen microbiome sampling and analysis.

Case study:

Reproductive endocrinology for endangered Australian wildlife

Captive breeding programs are the last resort for many endangered species, but it is notoriously difficult for animals to breed successfully in zoos. In part, this is due to lack of knowledge about their reproductive endocrinology: that is, the hormones that stimulate (and signify) fertility. In partnership with Zoos Victoria, Dr Kerry Fanson is working to improve the success rates of captive breeding.

La Trobe's Wildlife Conservation and Reproductive Endocrinology Lab (WiCRE) has analysed hundreds of samples from 16 different species in projects spanning Melbourne Zoo, Healesville Sanctuary, and Werribee Open Range Zoo. While reproductive monitoring is well-established for some species, such as the elephants whose calves were born in 2023, WiCRE have conducted groundbreaking research for Australian natives such as Leadbeater's possums, Tasmanian devils and *pookila* (native mice). Fanson's team have developed novel non-invasive sampling techniques to determine female fertility.

In 2024, the Tasmanian Devil breeding program at Healesville Sanctuary welcomed their 200th joey, representing a major milestone. **"We can manage our endangered species breeding programs with a whole lot of new information that just hasn't been possible before,"** comments Dr Marissa Parrott (Senior Conservation Biologist, Zoos Victoria). WiCRE were finalists in the 2024 Engagement Australia Award.

PEACE, JUSTICE AND STRONG INSTITUTIONS

Case study:

Women in prisons: Strengthening Connections

For women in prison, safe and supportive relationships are the greatest predictor of women's ability to stay safely out of the corrections system, post-release. The Department of Justice and Community Safety (DJCS) funded La Trobe's Bouverie Centre to develop and pilot an evidence-based program that would help reduce the risk of recidivism by **helping women heal relationship ruptures and strengthen safe connections with family and friends**.

The program, Strengthening Connections, was brought together and delivered by Bouverie's clinical, First Nations and research teams. It is the first family therapy program for women, operating in both Victorian women's prisons. Over 800 individual, group and family therapy sessions were delivered between 2020 and 2023, focused on building healthy relationships, recognising unsafe relationships, self-care, parenting, and future goal setting. Participants and therapists reported enhanced empowerment, and family and community reconnection. DJCS renewed funding to continue the program until June 2024.

Case study:

Influence of rape myths on jury decision-making

'Rape myths' are social narratives that have the effect of negating claims of rape. Despite increasingly specific legislative language aimed at challenging rape myths within trials, research led by La Trobe's Emma Henderson and Kirsty Duncanson has shown that traditional myth-based narratives continue to resonate strongly and influence jury decision-making, shaping the meaning of consent in trials and the way in which juries process information. Their research shows that these myths are circulated by barristers in rape trials, and that Law School core curricula do not adequately address the issue of rape myths and other contextual information about sexual offences.

These findings formed the basis of their submission to the *Senate Legal and Constitutional Affairs Committee inquiry into Current and Proposed Sexual Consent Laws in Australia*, following which Henderson and Duncanson were invited to stand as expert witnesses at a committee hearing and to respond to submissions made by Liberty Victoria and the Law Council of Australia, amongst others. The recommendations of their submission are reflected in recommendation 11 of the final report, which states that 'The committee recommends that the Attorney-General's Department, in collaboration with the Australian Institute of Judicial Administration and other relevant stakeholders, develops and delivers a **National Sexual Violence Bench Book**…[which] should specifically address rape myths and misconceptions'.

Case study:

Digital mental health care and the law

Digital mental health services, including telehealth, digital therapies, and sensor-based monitoring, have become increasingly prevalent post-pandemic. There is a pressing need for regulation to keep pace with practice. Research by La Trobe's Dr Piers Gooding has contributed to the development of **legal and ethical frameworks for digital mental healthcare**, particularly the essential dimension of lived experience involvement.

Gooding co-authored a 2024 report on lived experience in digital mental healthcare for the UK-based Wellcome Trust, which is now required reading for applicants in Wellcome's global mental health funding call (totalling £90 million in 2024). He also co-authored the position statement on ethics and law in 2022 for the eMental Health International Collaborative (eMHIC), the global peak body for best practice in digital mental health, contributing to policy and strategy in New Zealand and Canada and described by the Executive Director of eMHIC as playing 'a significant role in shaping global discussions on digital mental health'.

PARTNERSHIPS FOR THE GOALS

Case study:

Accountability ecosystem analysis for development in the Pacific

The UNDP's Vaka Pasifika project works to facilitate accountable governance and the management of finances for development in Pacific Island countries. However, accountable governance and effective financial management needs to be grounded in an understanding of local dynamics and relationships, within which personal and political identities are often inseparable.

In 2023 and 2024, Dr Lisa Denney and La Trobe's Centre for Human Security and Social Change (CHSSC) provided the UNDP with six country-based case studies (Vanuatu, Tuvalu, Solomon Islands, Kiribati, Palau and the Federated States of Micronesia) analysing how accountability is understood in each context; the power dynamics at play; the rules that shape local practice; and the consequent opportunities and constraints. These localised studies are accompanied by a synthesis report that draws out the key findings about the political economy constraints for accountability in the Pacific Island countries studied.

Following this research, **the UNDP has established "Fellowship Schemes" in Tuvalu and the Solomon Islands**, bringing together influential actors – identified by CHSSC research – to progress their approaches to accountability. The CHSSC is accompanying these Fellowship Schemes with action research to document how they operate, what they achieve, and what this tells us about how to progress accountability in the Pacific.

Case study:

Pacific Youth Development Framework

Since 2013, the interests of young people in Pacific Island states have been represented by the Pacific Youth Development Framework (PYDF). The PYDF sits under the auspice of the Pacific Community (SPC), the region's premier development organisation with country membership throughout the Pacific, and the Pacific Youth Council (PYC), the region's peak body for youth representation. La Trobe's Dr Aidan Craney and Allan Mua Illingworth have been assisting SPC and PYC to gather data on the priority challenges currently facing young people in the region, as well as opportunities for building leadership capacity.

In recognition of these needs, **Pacific Ministers for Youth met in September 2024 for the first time in over a decade** to approve a revision of the PYDF until 2035. Craney and Illingworth have been appointed to coordinate design of this document, which will be used to guide policy and programming for Pacific governments and development partners.

Read more about the Pacific Ministers for Youth 2024 meeting

PARTNERSHIPS FOR THE GOALS

Pathways to impact:

Blue Security and the Indo-Pacific: order, law and power

The Indo-Pacific region is vital to Australia's interests, home to many coastal states, some of the world's busiest shipping routes, valuable resources such as energy and fish, and complex territorial, maritime and strategic disputes and contestation. *Blue Security*, initiated and led by La Trobe Asia director Professor Bec Strating, is a consortium of six Australian institutes funded by the Department of Foreign Affairs and Trade (DFAT) which brings together leading regional experts in politics, international law and strategic studies to focus on three key pillars of maritime security in the Indo-Pacific: order, law and power. Blue Security's Senior Coordinator (Programs & Research) Kate Clayton led the emerging leaders plank of the program, which supports Early Career Researchers across Australia and Southeast Asia in developing their networks and expertise and refining skills in public communication.

In August 2023, the Blue Security consortium was approached by the Office of the Prime Minister and Cabinet to partner on its ASEAN-Australia Maritime Cooperation Track, held 3-4 March 2024, as part of the ASEAN-Australia Special Summit. This comprised public and track 1.5 events, including keynote speakers (Foreign Minister Penny Wong and Philippines' Secretary of State Enrique Manalo), experts and practitioners from across ASEAN and Australia, and showcased *Blue Security* research and publications. The outcomes included **'enhanced maritime cooperation, supporting implementation of the ASEAN Outlook on the Indo-Pacific and ASEAN Maritime Outlook** to develop the knowledge, skills and confidence in maritime enforcement roles'.

Case study:

Early human settlement in the Jordan Valley

For over 20 years, Phillip Edwards' team have been investigating the origins of sedentary human settlement in the Jordan Valley. The site of Wadi Hammeh 27 has recently revealed a spectacular multiple burial, dated to 12,500 BCE. Eight interments have been identified since 2022, accompanied by bone and shell jewellery. It is the richest multiple burial of the period discovered in 70 years. The site has also yielded intact caches of items, including a well-preserved tool-bag, and a series of basaltic pestles and mortars. Wadi Hammeh 27 is also significant for the world's earliest example of freestanding sculpture, identified as representing aspects of a 'tortoise cult'.

Material from Edwards' excavations is now exhibited in six Jordanian museums, including the recently opened Jordan Museum, where a reconstruction is located in the first of the museum's grand galleries.

Located close to Jordan's borders with Syria, Israel and the Palestinian West Bank, Wadi Hammeh 27 has also promoted international collaboration and stability, hosting diplomatic visits from Australian and Jordanian political figures. Collaborations with Jordanian colleagues, including the country's first luminescence lab, have also strengthened bilaterial relations, while community involvement in the dig has resulted in positive cultural interchange at the local level.