



**nuw
alliance**



A VISION FOR THE SIX CITIES REGION

***The NUW Alliance's
compact with Australia's
first global city region***



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The NUW Alliance's compact with Australia's first global city region

October 2022

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SUGGESTED CITATION

Delahunty, E., Downing, N., Marks, A., Osborne, M., & Tancred, T., (2022), A Vision for the Six Cities Region: The NUW Alliance's compact with Australia's first global city region, NUW Alliance.

DISCLAIMERS AND CONTACT

The views expressed herein are those of the authors and do not necessarily represent the views of the NUW Alliance or the member universities and/or the stakeholders who participated in the development of this publication.

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ACKNOWLEDGEMENT OF COUNTRY

In the spirit of reconciliation, the NUW Alliance acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

ABOUT THE NUW ALLIANCE

The NUW Alliance is a partnership of four leading Australian universities: the University of Newcastle, UNSW Sydney, the University of Wollongong and Western Sydney University.

Together, the partner universities pursue collaborations in the interests of their combined communities, with a particular focus on the Hunter, Greater Sydney and the Illawarra, 'Six Cities Region'.

The NUW Alliance spans an area home to more than 75 per cent of NSW's population and 25 per cent of Australia's. The scale and depth of the Alliance is without peer in Australia, with over 240,000 students, plus 18,000 staff, working across 37 locations, driving more than \$1.4 billion in industry, government and community partnered research.





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FOREWORD

Governments, community and industry are planning on a larger scale to achieve greater cohesion, momentum and impact. The 'Six Cities Region', spanning Newcastle, Wollongong and Greater Sydney, represents Australia's greatest opportunity for realising transformative, sustainable and inclusive development in the decades ahead. The NUW Alliance is committed to realising that potential for the communities we serve. That principal guides our vision for the Six Cities Region.

Importantly, the re-telling and progressing the story of the Six Cities Region must start with and be guided by its First Nations People. Understanding the centrality of place, belonging and respect in all that we do as university partners is critically important as we share our vision for a cluster of cities evolving on what always were and always will be Aboriginal lands.

As drivers of the knowledge economy, and a force for social good, universities have a critical role to play. The NUW Alliance partner universities are embedded in every major centre throughout the Six Cities Region. This is a footprint tailor made to synergise with government planning, community aspirations and industry trajectories across the area in question. Figuratively, it is a moment of planetary alignment all too rare in policy development and planning. If we are to maximize the opportunity, ensuring we have the right focus is essential.

The NUW Alliance's vision for the Six Cities Region begins with three priorities: Women, Infrastructure and Sustainability. Acknowledging that these themes are not linear or separate from each other, they are clear rallying points for the collaborative application of our expertise, they are frameworks for benchmarking, and they are readily translatable to our key constituencies: government, industry and, most importantly, the community.

The very existence of our collaboration as a four-university partnership, is proof that nobody can go it alone. By directing our energies towards supporting women, infrastructure and sustainability across the Six Cities Region, the NUW Alliance invites all stakeholders to join with us in the common objective of social good.

If guided by respectful, transparent, and progressive intent, the outcomes we realise in the interests of the Six Cities Region – including our mistakes and successes – could set the benchmark for wider, university-driven partnerships in the national interest.



**Professor
Alex Zelinsky AO**

Chair, NUW Alliance
Vice-Chancellor
and President
University of Newcastle



**Professor
Trish Davidson**

Vice-Chancellor
and President
University of Wollongong



**Professor
Attila Brungs**

Vice-Chancellor
and President
UNSW Sydney



**Professor
Barney Glover AO**

Vice-Chancellor
and President
Western Sydney
University



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As drivers of the knowledge economy, and a force for social good, universities have a critical role to play.







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It is a moment of planetary alignment all too rare in policy development and planning

OUR VISION

Foregrounding the First Nations people of the Six Cities Region, the NUW Alliance collaborates for social good, prioritising women, infrastructure, and sustainability across the Hunter, the Illawarra, and Greater Sydney.

WHY THE NUW ALLIANCE?

Australia's first global city region demands a partnership of reciprocal scale, purpose and potential. The NUW Alliance is an alliance fit for a global city region. Universities bring impartial evidence, deep expertise, agility, and rigour. The consolidation of NSW Government planning and policy development on the spatially defined Six Cities Region – via the Greater Cities Commission – creates a rare and opportune synergy, to achieve focus and purpose in effort. This is a moment we cannot afford to miss in service of our communities.



240,000
students



18,000
staff



\$1.46m
research



37
locations



THE SIX CITIES REGION

In December 2021, the NSW Premier announced the Greater Sydney Commission would evolve to become the Greater Cities Commission. The Commission's original 'Metropolis of Three Cities', spanning the Eastern Harbour City, the Central River City and the Western Parkland City will now encompass a six-city region, bringing together the cities of the Lower Hunter and Greater Newcastle, Central Coast, Greater Sydney and Illawarra-Shoalhaven to create a globally competitive Six Cities region, a vision where the 30-minute city is realised, and housing supply and choice, land use and transportation is adapted to suit the growing and changing population needs.

The transition to a focus on 'global city' policy and planning reflects a growing 'mega region consciousness', globally. Demand for truly 'liveable' cities has seen the 'Rise of Macro-Regional' (i.e. 250km+ beyond CBD) approaches to strategic planning in European, Asian, and North American metropolises.

CITY IDENTITIES

The Six Cities Region is comprised of the following city identities:

- **Eastern Harbour City** (includes Sydney CBD): Centre for finance and global trade.
- **Central River City** (includes Parramatta): Government and services.
- **Central Coast City**: Lifestyle city.
- **The Lower Hunter and Greater Newcastle City**: northern gateways; ports and centres of industrial innovation.
- **Western Parkland City**: Aerotropolis incorporating the nascent Nancy Bird Walton Airport – Western Sydney International Airport.
- **Illawarra-Shoalhaven City** (includes Wollongong): deep sea port and centres of industrial innovation.

PRIORITIES

With a geographical footprint which precisely aligns with the Six Cities Region, the NUW Alliance's strategic priorities will focus on support for our research, teaching and student communities and to provide positive social impact in the community at large. Although our Six Cities geographical location provides a clear focus, NUW Alliance will also work strategically to deliver global positive impact, leveraging our size and scale.

By definition, universities are at the vanguard of social, technological, economic and cultural change. They are agents of transformation, as well as subject to it. And they navigate and provoke transformation via evidence, rigor and – very importantly – collaboration. NUW Alliance is well-placed to utilize its expertise across all its considerable research areas, however in order to provide a clear direction, this Six Cities vision will focus on three (3) major themes – Women, Infrastructure and Sustainability.



UNIVERSITY OF
NEWCASTLE

WESTERN SYDNEY
UNIVERSITY

UNSW

UNIVERSITY OF
WOLLONGONG

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*The new Six Cities
Region approach is
designed to deliver
global competitiveness
and local livability.*

THE GREATER CITIES COMMISSION

DISCUSSION PAPER

THE SIX CITIES REGION: DELIVERING GLOBAL COMPETITIVENESS AND LOCAL LIVEABILITY

The NUW Alliance welcomes the release, 8 September 2022, of the Greater Cities Commission's, Discussion Paper: The Six Cities Region Delivering global competitiveness and local liveability and note its commitment to embedding a First Nations Voice; the connectivity of the region; housing supply, diversity and affordability; inclusive places linked to infrastructure; powering local jobs and economies; and climate resilient green cities.

Comprising the Lower Hunter and Greater Newcastle City, Central Coast City, Illawarra-Shoalhaven City, Western Parkland City, Central River City, Eastern Harbour City, the Six Cities Region is home to over six million people. Significant population growth is forecast for the region with an anticipated population of over eight million people within the next two decades.

The city region approach offers the benefits of scale to support better housing supply and affordability, the commensurate growth of infrastructure to support the population increase, cities that address issues of sustainability and climate whilst also offering the benefits of greater economic scale. The intention of the Discussion Paper is to build on the work of the 2018 Region Plan which focused on the Greater Sydney Region.

A new Region Plan for the new Six Cities Region is currently under development with a staged approach to the further delivery of new city and district plans over the next two years. The NUW Alliance is well positioned to assist in the development of these plans and indeed the Strategy for the Six Cities Region to be developed and delivered in 2023.

The new Six Cities Region approach is designed to deliver global competitiveness and local livability. With a connected region across the six cities and jobs within 30 minutes by public transport from homes, the vision for the Region is to offer economic opportunity within a 15-minute walk from vibrant local centres.

With more affordable, sustainable and accessible housing connected to new transport and social infrastructure, the Region will be enabled to adapt and change as needs change over time. The economic diversification of the wider, connected economies will provide greater resilience for what is to come. With global climate leadership, Net Zero targets are embedded in the Regions infrastructure, housing and transport.

As highlighted in the vision, "More than 65,000 years of continuous culture is central to our shared identity and sets us apart from anywhere else in the world. The wisdom and aspirations of First Nations peoples are recognised and embedded in planning for our future, and we care for Country."

The Commission will recognize the languages, cultures and aspirations of the peoples who have been custodians of the many lands within the Six Cities Region and ensure the cultural safety and relevance of the strategic planning process.

As the 20-year vision is developed, the Alliance partners will continue to work in synergy with the Commission in pursuing common strategic objectives in the interests of our six cities communities.

The Six Cities Region will be connected through Country, transport and economic links, a hierarchy of centres and environmental assets.



Note: The Commission has recommended Sutherland Shire move from the Central River City to the Eastern Harbour City. This change is subject to a regulation being made to amend the Greater Cities Commission Act 2022.

This map draws on existing plans and will be developed further during the strategic planning process.



BEAUTIFULLY AND CHANGEABLY DIFFERENT

A COMMITMENT TO INDIGENOUS KNOWLEDGES AT THE CORE

Whilst the notion of a Six Cities Region (SCR) vision is exciting on a macro level, as an Indigenous woman a ripple of fear creeps in, then a wave of nervous intrigue. Questions around what the impact and opportunities of this movement will have on the numerous and diverse Indigenous communities within this footprint emerge. We as Indigenous Australian Peoples, are not homogenous. We are beautifully and changeably different. Our epistemologies, our ways of being and knowing, are anchored in our Connection to Country, our ancestors' life journeys and the impact of colonisation including policy, legislation and ultimately racism. It is our knowledge, experiences and participation within the SCR that can positively impact and elevate the success of the entire mandate.

Prospects of improved access to affordable housing, consolidation of social and environmental considerations are goals that have the potential to unite all individual and communities within the SCR. Ideologically uniting 75% of NSW total population is a rousing concept and can provide collective hope for the masses. The benefit for individuals, businesses and the environment are unquestionably bountiful. And so, Indigenous voices must be present in all aspects and stages of developing the strategy. From an Aboriginal community perspective, quite simply the SCR's decision – making and engagement charter should read 'It can't be made about us, without us!'

A question that fuels my fears; is "what happens if Aboriginal perspectives aren't adopted?"

Notably, I go beyond questioning the criticality of just engaging Aboriginal people and communities in the process of consultation. From my experience 'consultation' with Aboriginal people has fast become a performance that occurs at the end of the development phase and at the un-editable point of finalisation. Consultation has become the tick-box exercise that's offensively practiced as a 'pre-implementation presentation' to Aboriginal stakeholders. SCR could subsequently refabricate authentic consultation with our communities. Too often, Aboriginal people/communities are presented with proposals that are set in stone, rather than being involved at inception.

To ignite genuine inclusivity, for Aboriginal people, it is imperative that engagement and decision-making is carried out proper and respectful ways. 'Proper ways' is a protocol that places appropriate Aboriginal representatives (note plural, not singular representation) at all decision-making tables and our voices elevated in these discussions. It's here that the seed of agency is planted. Forget tokenism; embed Indigenous peoples in the heart of all elements of development. Moving beyond having a seat at the table and having a voice in these spaces, the responsibility extends to adoption of our counsel and a preparedness to have elements vetoed. Reimagine Western views as inferior, especially when dealing with Country.

No one wants the SCR initiative to be another historical 'shit show' that future generations look back and shake their heads in disbelief and despair.



As the oldest living culture, our connection to and knowledge of Country must be celebrated, trusted and invested in

If goals of sustainable development, land use, liveability and environmental quality are to be achieved, a shift in relationships with and the positionality of the relevant Indigenous communities must occur. As the oldest living culture, our connection to and knowledge of Country must be celebrated, trusted and invested in. The SCR should comfortably opt to take a back seat and allow our knowledge holders to take the wheel.

The mandate to shape 'Australia's first global city region', a remit that is bolstered by a legislative framework, I ponder how this apolitical entity could assist Indigenous Australia heal and feel connected to the changes. Symbolically, the geographical landscape within the SCR encapsulates some of the most devastating atrocities of our people since invasion. It would be medicinal to commence shaping Australia's first global city region with positively educating the residents thus 25% of Australia's total population, on the Uluru Statement from the Heart campaign. Publicly, supporting the Referendum and Constitutional change could successfully navigate the way for healing and change. This action would signal that the SCR is committed to systemically over-turning ways of engagement. It illuminates a commitment to dismantling imperialistic structures in their rebuild. This output fuels my heart with hope.

If done well, I see, Indigenous peoples gaining enhanced participation and growth in the economy under the SCR initiatives. On the premise of 'You can't be, what you can't see', Universities, TAFE, Registered Training Organisations, and local businesses play an imperative role in showcasing careers, employment opportunities and education pathways for our younger community.

There are significant gains, for us to collectively develop a suite of non-competitive, aspiration-building projects. Participation in these projects can showcase the points of difference and strengths from each geographical area. As an Indigenous woman, I know first-hand the power of education. It was the tool that released me from the shackles of trans-generational poverty. I wholeheartedly welcome a collaborative approach engaging higher education students, alumni, industry partners and employers to participate and commit to economic and social equity and inclusion.

If conscious choices are made to opt-in and opt-out of trustworthy engagement, then a SCR 'shit show' is foreseeable. However, with an unwavering commitment on planning to be uncomfortable and recreating spaces that centre Indigenous knowledge systems, in all decision-making, the success of the SCR is inevitable.

Jaymee Beverage
Executive Director (Indigenous Strategy)
Director (Woolyungah Indigenous Centre)
University of Wollongong





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Research related to women and their economic, physical and social health is a strong area of capability across the NUW Alliance



WOMEN

Sustainable Development Goal 5 – Achieve gender equality and empower all women and girls.

Sustainable Development Goal 4 – Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

For women to achieve meaningful, equitable and impactful equity, large scale structural change is necessary. This is a field in which the NUW Alliance universities have exceptional expertise. In economic, gender, sociological and related research and teaching fields, the NUW Alliance is well-placed to apply those concentrations of expertise in areas that both guide and respond to community imperatives.

The NUW Alliance supports gender equality (SDG 5) with a strong agenda on gender equity in the economy and the wellbeing of women and girls. The NUW Alliance is committed to furthering women's equity in all aspects of life including: participation in the economy, economic security and economic prosperity, access to education in all fields of study, leadership, participation, and representation, intersectional issues and wellbeing through research, active policy development and affirmative action.

NUW Women is a way to rally our existing expertise, which can then be honed through consultation across our connected city regions. NUW Women is designed to drive the agenda for gender equity through the formation of a Steering Committee and a program of activities in support of its objectives.

The NUW Alliance partners support gender equity and are inspired by diverse feminisms in support of social change with a strong agenda to improve opportunity for women in the economy and the wellbeing of women and girls. Research related to women and their economic, physical and social health is a strong area of capability across the NUW Alliance. All of the NUW Alliance partners are committed to furthering the empowerment of women in every facet of life. NUW Women provides comprehensive research and supports women to undertake higher education programs which provide a pathway to non-traditional careers.

We have seen, nationally, that a mood for long overdue change in attitudes to women, and the responsibilities of men, is occurring. We can seize and support this moment generational change for women and girls across our cities and further afield.

“Women are disproportionately represented in lower income brackets, while men are approximately twice as likely to be in the top 25 per cent of earners than women.... The World Economic Forum’s Global Gender Gap Report attempts to benchmark countries’ performance on gender equality more broadly, against four key sub-indexes: economic participation and opportunity; educational attainment; health and survival; and political empowerment. According to the report, Australia’s ranking of women’s economic participation and opportunity has fallen from 42nd in the world in 2016 to 70th in 2021. This is largely attributed to the indicator of estimated earned income, which seeks to estimate how much command women have over a country’s economic resources. On this indicator, Australia has dropped from 57th in the world to 125th over the 5-year period.”

‘She’s Price(d)less: The economics of the gender pay gap’, KPMG, prepared with the Diversity Council Australia and the Workplace Gender Equality Agency, 2022



Barriers to economic security still exist for women. NUW Alliance is committed to supporting increased flexibility in the workplace; more diverse jobs; the creation of new leadership pathways for women and improving access to childcare. The NUW Alliance has established a Steering Committee for NUW Women to begin a broader conversation on issues in our community affecting women. Chaired by the Vice Chancellor of the University of Wollongong, Professor Patricia Davidson, the Committee draws together academic and professional representatives from all four partners alongside senior business peak body, social services, and NSW Government representatives.

The committee will consider both internal and external opportunities to support the agenda for women including: support for the economic participation of women; informing and shaping policy on women including areas such as gendered violence and relationships; support for women in non-traditional disciplines of study and work; support for women to take up leadership positions and ensure equitable representation at senior levels; and support for career progression of women at our partner institutions.

“Investment in childcare is the best way to improve women’s economic opportunity, increase female workforce participation and close the gender pay gap... Improving the affordability and accessibility of childcare is once in a generation economic policy. This investment, delivered alongside the Commonwealth’s childcare reforms and market dynamics, is expected to see up to 95,000 women enter the workforce or take on more hours, driving down the gender workforce participation gap by up to 14 per cent within a decade.”

Matt Kean, NSW Treasurer,
NSW Budget 2022-23



Interview – Women in the Economy

Associate Professor Rae Dufty-Jones, Principal Research Fellow, Centre for Western Sydney Western Sydney University

One way in which women contribute to the economy is in terms of the national labour force. Indeed, in this respect many women play a dual role as both **members** of the labour force and as **producers** of future members of the labour force.

According to the Australian Jobs Skills Summit 2022 held recently, we are experiencing a significant shortage of skills in key areas, can increasing the participation of women in the workforce improve this?

Australia's performance in this space hasn't happened by accident but is rather the product of more than half a century of public policy choices around growing the nation's labour force. Traditionally, policies designed to increase labour force supply have been framed and pursued as a choice between either increasing female participation OR through immigration. Since colonisation, Australia's labour force policy has typically relied on immigration to boost supply as and when needed. Immigration has been prioritised over pursuing policies that support the participation of women (e.g. paid parental leave, free or affordable childcare etc). Yet the short-term impact of COVID combined with the long-term trend of declining national birth rates starkly revealed the structural risk that traditional labour force policies have exposed the Australian economy to. To address workforce shortages, Australia will need to both use immigration but also improve the role of women and their access to the workforce.

Women continue to have lower levels of economic participation and security compared to men – what are the key changes that might be enacted to improve the situation?

Time away from work to have children seems to be the biggest factor here. Women often take time off that is unpaid and/or return to work on a part-time basis if they return at all. This impacts their career progression, their ability to earn a higher wage, and their ability to save for retirement.

Again, these circumstances have not occurred by accident, rather there are a range of policies that signal to households that when children are born it is time for mothers to step away from employment. The obvious policies that communicate to women

that they are not valued members of the labour force once they have children include the cost of childcare and the limited support provided by government funded paid parental leave. However, there are other, more subtle, policy settings that tell women that the government would prefer they stay at home rather than return to work. Key among these is the "Family Tax Benefit". This policy has a long history. First introduced by the Menzies Government in 1941 as the Child Endowment, this policy was pursued as it allowed the government of the day to also justify deferring an increase in the basic wage for six months. The most recent iteration is the "Family Tax Benefit" Part B, a payment introduced more than two decades ago to compensate families when one parent stayed at home to care for children.

In addition to having better access to early childhood education and care, what other initiatives would make a material difference in increasing women's participation in the workforce?

There are a number of options that could be explored. I think one of the main lessons learned from the COVID pandemic was the success of the 'Job Keeper' payment – keeping employees connected to their work so that when lockdowns ended, they were more likely to have jobs to return to. Yet, this is the same problem when a parent takes time off work to look after young children, a 'lockdown' where a parent disconnects from their workplace for months or years. When we view parental leave in this way it becomes clear why so few men take it up.

However, another unintended result of Job Keeper was that when this payment was introduced Australia's gender pay gap narrowed! Paid parental leave payments should be increased with a shift in understanding this payment as just another type of 'Job Keeper' – it is something that keeps parents connected to their work but also would work more broadly to narrowing Australia's gender pay gap.

Associate Professor Rae Dufty-Jones
Principal Research Fellow, Centre for Western Sydney
Western Sydney University





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Our universities are committed to tackling the sustainability challenges that face our communities, both in Australia and globally







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Our priority is to bring innovative sustainability solutions to government





SUSTAINABILITY

Sustainable Development Goal 7 – Ensure access to affordable, reliable, sustainable and modern energy for all.

Sustainable Development Goal 12 – Ensure sustainable consumption and production patterns.

Sustainability is a core global challenge, requiring a solution which improves quality of life and meets the needs of the present generation, without compromising those of future generations. The NUW Alliance has a responsibility to protect the land of one of the world's oldest living indigenous populations upon which the Six Cities Region spans, encompassing vastly diverse ecosystems, coastline and waterways, national parks, and world-heritage area. Our priority is to bring innovative sustainability solutions to government. Geographically, our scale and scope are unparalleled to offer an educated on-the-ground perspective to policy makers.

At the NUW Alliance, we believe the greatest impact is achieved by collaboration. It requires universities, industry and government working together. Universities are enablers of government sustainability initiatives in the Six Cities Region. The NUW Alliance brings together breadth of researchers from a range of disciplines and innovation in new technologies and industries, resulting in fast-tracked generational change. Our universities are committed to tackling the sustainability challenges that face our communities, both in Australia and globally.

The consultation with universities offers science and economic backed innovation, access to inconceivable opportunities that are being incubated and proven scalable initiatives to solve for access to: affordable modern energy, new technologies to empower consumers' sustainable decision making and choices, to cleaner modes of transport, as well as farmers and businesses utilising latest technology and plant and equipment.

In the global 'Race to Zero,' the NUW Alliance's commitment to creating new jobs in new industries and resource and carbon constrained future is paramount. This can be achieved ahead of target with collaboration. Across the Six Cities region, a moral obligation exists to drive the renewal of industry and employment opportunities for our communities in the wake of their industrial legacies as we shift from fossil-fuel to clean renewables. Treasurer and Energy Minister Matt Kean highlighted the Hunter-Central Coast Renewable Energy Zone (REZ) will continue to be the energy powerhouse of NSW and is vital to ensuring the future reliability and affordability of electricity, translating into prosperity for the region.

This is reflected in industry and private capital attracting more than \$100B of potential investment interest in the Hunter and a further \$40B in the Illawarra region for the REZ. Research is a platform to inform and drive changes in technology uptake and investment in sustainability, biodiversity, urban planning and circular economy practices across our regions. Our researchers and educators in these fields will convene as a NUW Sustainability Innovations Group to progress these opportunities.

The growing number of renewable energy projects across the Six Cities region illustrates mounting commitment to helping industry thrive and create low carbon jobs of the future. The NUW Alliance has an ongoing pipeline of initiatives that will create jobs, deliver real social benefit and drive economic activity. Since inception, the NUW Alliance commitment can be demonstrated by the successful NSW Decarbonisation Innovation Hub, an unprecedented opportunity for the NUW Alliance and partners to work collaboratively. The breadth and depth of this consortium is unparalleled in its capacity to drive decarbonisation through energy-related and climate-related research and innovation.

The NUW Alliance in partnership with UTS welcomed the NSW Premier, Dominic Perrottet's commitment of \$260M to establish an Advanced Manufacturing Research Facility (AMRF). The AMRF will bring universities and industry together to generate new technologies and globally competitive manufacturing innovations. The NUW Alliance understand what is required to deliver a technology step change in advanced manufacturing. AMRF is an urgent task for universities, government, industry, and the region. It is not just about technology or innovation, it is about making good on commitments to drive knowledge job creation.

NUW Alliance have focused the distinct expertise we have across the partnered universities showcasing world-leading technological innovation, ecological understanding and biodiversity expertise across the Six Cities Region.



The necessity of the sustainability priority is reflected in NSW Government budget with \$3.3B set aside for science, innovation, and clean energy. In particular \$703M allocation for The Future Economy Fund to expand and accelerate R&D and commercialisation opportunities across NSW and institutions that will grow the economy and create jobs.

With higher education the largest service sector export in NSW, collaboration between NUW Alliance and the government uniquely positions NSW as a global research hub and showcase sustainability initiatives to the world. Attracting international students to conduct sustainability projects in NSW drives state and national economic growth, and bolsters jobs across industries.

Sustainability whilst often synonymous with clean energy, intersects infrastructure, production and consumption across manufacturing, waste minimisation or elimination, reusable and bio-degradable product development, technology, and urban development.

The collective research and knowledge of the NUW Alliance is powerful. The geographical diversity of the Six City Region uniquely positions NUW Alliance to offer policy makers dialogue to meet the needs of industry, business, and community. UNSW Futures Institute facilitates cross-faculty and cross-disciplinary work by driving innovative approaches to research, addressing scientific and social challenges. Similarly, UOW's Sustainable Buildings Research Centre (SBRC) is a multi-disciplinary facility addressing the challenge of transforming our buildings and built environment into sustainable, resilient, and effective places where people live and work.

Another illustration of multidisciplinary model for transformational research is Newcastle Institute for Energy and Resources (NIER) with priority areas of 'Energy Technologies', 'Critical Minerals' and 'Clean Environment.' The UOW Energy Futures Network conducts research in renewable energy systems and integration, power systems, sustainability (including building design), power quality and reliability, battery energy storage and management systems, distributed energy generation, microgrids, infrastructure modelling and economics, and R&D leading to a more hydrogen-intensive economy.

Priority Research Centre (PRC) for Frontier Energy Technologies & Utilisation conducts cutting edge research on emerging energy technologies, providing a fresh, streamlined approach in clean energy research and industrial application.

Essential research is being undertaken by Hawkesbury Institute for the Environment into soil biology, ecosystem integration and function, sustainable agriculture, food security and plant and animal adaptations to a changing climate.

Collaborative partnerships such as Living Labs are utilising campus assets that have delivered initiatives to broad societal issues of urban development, natural and cultural heritage, renewable energy, urban heat, water recycling, and peri-urban food systems.

The Government's housing and liveability priorities are being prioritised by the Smart Cities and Infrastructure Cluster, seeking to promote and advance the efficient design, planning and delivery of urban environments, infrastructure, and properties through the use of spatially integrated information and smart technologies.

Aligning NUW Alliance and NSW Government on sustainability priorities will result in commercialisation of research to solve new zero-carbon, zero-waste circular economy, positioning NSW at the forefront of innovation and research globally.

The NUW Alliance can deliver innovative solutions to create new jobs, address skills shortage and overall reduce the cost of living. Industry, business and consumers need to be able to make affordable sustainable choices. NUW Alliance initiatives across the Six Cities are well-underway and we are invested in making sustainable generational change with strong economic prosperity outcomes. NUW Alliance, government and industry engagement on sustainability and environmental protection will deliver real social benefit to our communities and improved well-being for this generation, our children.



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***The NUW Alliance
has an ongoing
pipeline of initiatives
that will create jobs,
deliver real social
benefit and drive
economic activity***





Case-study: Working for the Rivers

Dr Ian Wright has advocated for clean water across Australia over his career at Western Sydney University. Coal mines have an impact on the waterways that surround them, but until recently, the government only effectively regulated a handful of these impacts.

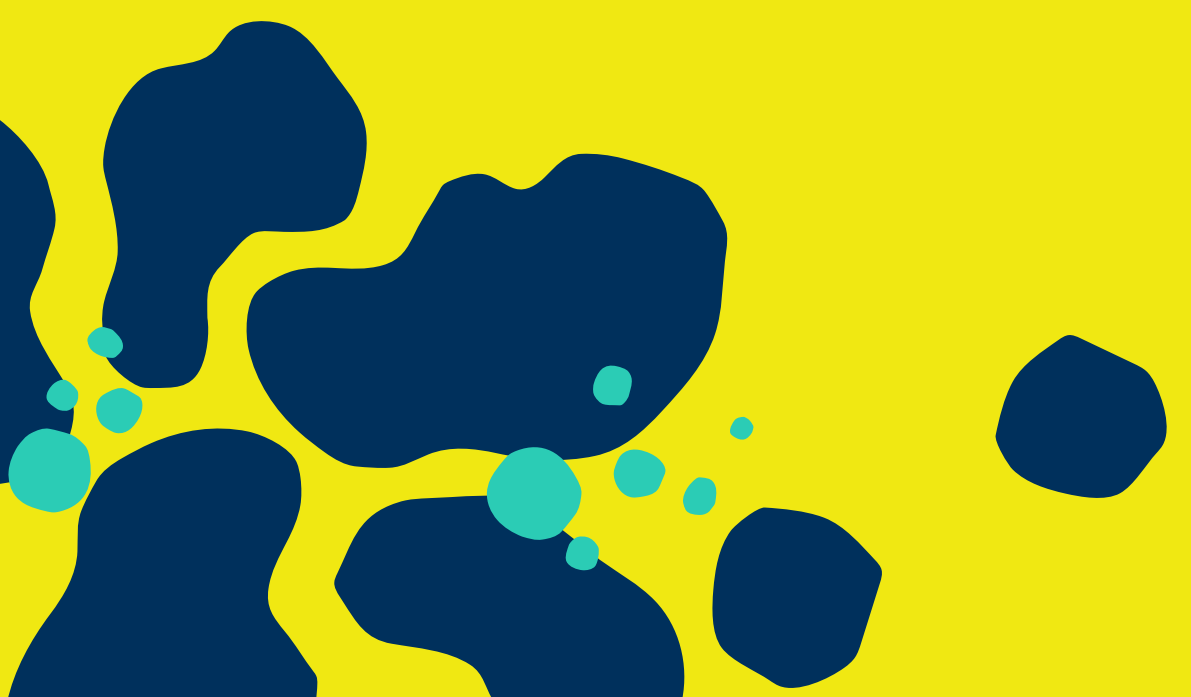
In the Sydney Basin, this has led to hazardous levels of heavy metals in waterways including waterways flowing through the Blue Mountains Heritage Area. Ian's work on the impact of coal mining on the Georges and Wollongambe Rivers has led to better regulation of wastewater discharge from coal mining.

To make this change, Ian worked with government, industry and concerned community stakeholders. By focusing on consensus and evidence, Ian and his team have made breakthrough changes to the health of rivers in Sydney. Ian acknowledges the contribution of an energetic and dedicated research team of undergraduate and higher degree research students that have regularly worked in remote and challenging locations.

Dr Ian Wright
Senior Lecturer, Life Sciences
Western Sydney University



Image Credit: Sally Tsoutas



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The collective research and knowledge of the NUW Alliance is powerful.



Dr Ian Wright conducting research in the Wollangambe River, within Greater Blue Mountains World Heritage Area. Image credit: Dr Nakia Belmer.



Attracting international students to conduct projects in NSW drives state and national sustainability, and bolsters jobs across industries

INFRASTRUCTURE

Sustainable Development Goal 9 – Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.

Sustainable Development Goal 11 – Make cities and human settlements inclusive, safe, resilient and sustainable.

Sustainable Development Goal 12 – Ensure sustainable consumption and production patterns.

Infrastructure investment is at record levels across Australia, demonstrated by the Australian Government’s historic \$110 billion infrastructure commitment. Delivering these landmark infrastructure investments to support and service our communities will require collective action from state, territory and local government, industry and universities. The acceleration of infrastructure delivery across major projects is a key source of economic activity and jobs growth.

The Six Cities Region is the economic seat of Australia, leading the infrastructure agenda across the region will propel NSW and Australia globally. The NUW Alliance’s commitment to deliver flexible and resilient infrastructure that better responds to our changing and diverse community needs is augmented by our collective research strengths straddling the [life-cycle/sphere] of infrastructure planning, delivery and innovation.

With the \$6 billion commitment by the Australian Government to deliver Faster Rail, including \$1 billion for the Sydney to Newcastle link, which will rapidly connect people to places and services, stimulate regional growth, improve access to jobs, services and affordable housing. NSW Government’s Fast Rail vision seeks to slash travel times between Sydney and Newcastle to one hour, Sydney and Gosford to 25 minutes and Sydney to Wollongong in just 45 minutes.

Providing quicker and more reliable connections between Sydney, Parramatta, Gosford and Newcastle will substantially shape the Six Cities Region growth and connectivity.

“We’re committing \$500 million towards early works, planning and further development of the line that will initially minimise delays and eventually allow high speed travel and drastically cut travel times.”

Mr Matt Kean, Treasurer and Minister for Energy



“By building infrastructure we build opportunity. Our infrastructure pipeline provides jobs, skills development for young people and First Nations peoples, and allows more opportunity for women to access employment opportunities previously denied to them.”

Dr Rob Stokes, Minister for Infrastructure, Cities and Active Transport





Infrastructure underpins the liveability and productivity of our cities and regional communities through effective communications, transport, buildings and energy networks. In a rapidly evolving landscape, with the current environment of change, uncertainty and risk, how we plan and develop our future infrastructure requires an integrated approach.

Harnessing the NUW Alliance's collaborative expertise, research excellence and engaged industry networks, to address key infrastructure challenges faced by communities across the Six Cities, and beyond.

Each of our partner universities are research intensive universities and key contributors to research in Australia and the world, with a long-standing track record in developing research solutions which can be translated regionally, nationally and internationally.

Opportunities / Key Themes

- Change and uncertainty – re-thinking Australia's infrastructure to deal with the current environment of change, uncertainty and risk
- Digitisation – harnessing technology and innovation to drive new industries
- Unlocking the potential of every place – embracing the unique challenges and opportunities afforded by Australia's diverse geography
- Delivering public value – ensuring our infrastructure industry is delivering value for money
- Empowerment through data – using data to change the way infrastructure is delivered in Australia

NSW Opposition Leader, Chris Minns told the Sydney Morning Herald, that infrastructure needed to be built where and when it was required. Mr Minns said the state's population targets up until 2041 showed the local government area of Blacktown would have to take an additional 200,505 people, and Liverpool an extra 190,105.

Similarly, Camden would grow by 180,000 people, Parramatta by 140,000 and Penrith would need to accommodate an extra 140,000 people, Mr Minns said.

"Given that huge increase in population, we are not doing nearly enough to provide equity of infrastructure for these communities."

Mr Chris Minns
Member for Kogarah and
Leader of the Opposition



Evidenced expertise

Dedicated to helping governments and businesses plan for a better future, SMART Infrastructure Facility at University of Wollongong contributes to infrastructure planning in Australia through truly independent research coupled with deep academic rigour to ensure policy-makers and industry receives high quality and timely advice on major projects.

SMART Case Study:

Telstra-UOW Hub to make Australia a global leader in AIOT solutions

The University of Wollongong and technology giants Telstra, Microsoft and NVIDIA are uniting to position the Illawarra as a global leader in the uptake and creation of the Artificial Intelligence of Things (AIOT), helping Australia access a world market estimated to reach US\$26.2 billion by 2023.

The University's SMART Infrastructure Facility will establish the Telstra-UOW Hub for AIOT Solutions, delivering innovative, cost-effective and fit-for-purpose AIOT solutions for communities, enterprises and governments.

Its focus will be world-leading research in several AIOT technologies, including AI-enabled video analytics, sensor-embedded edge computing for optimised data fusion and transmission, as well as industrial digital twin technology.

Once established, the Telstra-UOW Hub will develop a regional ecosystem of innovative small to medium enterprises focused on AIOT products and services, and ensure greater sovereignty of Australia in sensitive sectors such as AI and IoT technologies.

Four initial pilot projects have been identified for immediate design and testing of AIOT solutions with 10 projects expected to be supported during the initial two years of the collaboration.

The four projects will focus on intelligent manufacturing, smart transport, smart logistics and resilient infrastructure, which will be tested at scale with the support of key end-users such as Bluescope Steel, Premier Illawarra, Remondis, and Wollongong City Council.

Future focused outcomes

NUW Alliance's partner universities evidence-based expertise already places sustainability at the forefront of infrastructure innovation.

"SMART is a wonderful example of the energy to break new ground and create value where none existed before, that exists throughout the University.

Professor Patricia Davidson, Vice-Chancellor & President, University of Wollongong



Addressing sovereign risks and building Australia's future capacity

“Australia has a unique opportunity to embrace automation and emerging onshore industries in the next decade via collaborative investment in manufacturing and engineering.

“Australia's composites industry is dominated by small-medium organisations, therefore collaborative approaches such as the SoMAC CRC are vital to build broad industry capability, as well as to provide the development environment to bring industry together in major projects.

“We are seeing Australia contemplate massive investment into the hydrogen economy, take a clear step forward in space, and rebuild its automotive presence in electric buses and cars. Composites are essential for these and other major industries to be competitive and position Australia at the forefront of global technology.”

Professor Nicholas Fisk, Deputy Vice-Chancellor, Research & Enterprise, UNSW Sydney



The Sovereign Manufacturing Automation for Composites Cooperative Research Centre (SoMAC CRC) will focus on research in composite technology to support emerging industries in Australia and boost the economy.

A consortium led by UNSW Sydney, the **Sovereign Manufacturing Automation for Composites Cooperative Research Centre's (The SoMAC CRC)** vision is to place Australia as a first choice for rapid prototyping, enabling decentralised composites production capacity and building Australia's sovereign manufacturing capabilities.

Created by the federal government to enable Australia's manufacturing industry to become more competitive, backed by \$69.9 million in funding. SoMAC CRC will leverage over \$189.3 million in cash and in-kind contributions from 36 partners to potentially generate \$2.1 billion in benefits to the composites industry. SoMAC CRC mission is three fold:

- to enable composites automation to improve the competitiveness, productivity and sustainability of Australian industries,
- Industry-focused education to upskill and reskill Australia's workforce, including the training of next-generation composites ambassadors, and
- Increasing research and development capacity in small to medium enterprises to target high yield commercialisation outcomes, job growth and economic prosperity.

Reinventing Cities for sustainable, healthy, prosperous and socially just urban futures

The UNSW Cities Institute is a pan-university, cross-faculty initiative that represents all of UNSW's cities' interests and is a multidisciplinary venture, which includes the Cities Futures Research Centre. The City Futures Research centre established in 2005 at UNSW has developed into a national leader in scholarly applied public interest research about our cities. Undertaking research in urban planning, housing, compact cities, health-built environments and urban analytics. The Centre conducts independent research and provides evidence-based inputs into contemporary urban policy debates and the planning of future cities.

Together with government, industry, education, community, local and international partners, UNSW Cities Institute leads the reinvention of our cities, advancing highly productive, sustainable, prosperous, healthy and socially just urban futures for Sydney, New South Wales, Australia and globally.

The UNSW Cities Institute is locally focused and globally orientated. Its cross-cutting themes are:

- Resilience and risk: Designing systems of resilience to manage acute and chronic shocks and risks.
- Environment and climate: Designing cities that contribute positively to the urban environment and anticipate challenges such as heat effects. Connecting to First Nations knowledge systems.
- Property and Housing: Developing strategies and policies that make cities affordable, inclusive and liveable.
- Transport and Infrastructure: Ensuring cities are liveable, accessible, and deliver positive environmental benefits and health outcomes.
- Community and Governance: Placing communities at the centre of design and policy. Ensuring the governance of cities deliver coordinated and sustainable outcomes.

“The Institute has a commitment to knowledge transfer through education and innovation. We are developing a suite of educational products from a Master of Cities, Graduate Certificates, Diplomas and micro-credentialled short courses for city leaders across the globe.”

Professor Claire Annesley, Dean,
UNSW Arts, Design & Architecture





Cities with integrated affordable housing have real economic and social benefits for the community.

Affordable Housing and Urban Research Institute

Cities with integrated affordable housing have real economic and social benefits for the community. Improving housing affordability and supply is central to the productivity and liveability of the Six Cities Region. Historically, Australia's housing, planning and cities policies have not been well-integrated. Researchers across the NUW Alliance partner universities are key contributors and researchers to the Affordable Housing and Urban Research Institute (AHURI), which seeks to consider the role, functioning and policy questions facing Australian cities by delivering integrated and robust evidence to guide policy development across housing, homelessness, cities and urban policy.

Collaborative City Planning

The **City Analytics Lab (CAL)** is a dedicated space designed to support collaborative city planning and user centred design. CAL has been established to support the envisioning of sustainable, productive, liveable and resilient cities and provides a unique opportunity to study the decision-making processes associated with city planning and design.

The **Newcastle Institute of Energy and Resources (NIER)** has 19 research groups and centres driving productivity and sustainability gains through applied research which seeks to unlock the potential for next-generation low-cost sustainable application to support regional resiliency.

The Centre for Infrastructure Engineering at Western Sydney University which has three research themes, Structures which is concerned with safety, reliability and mitigation strategies related to structures, with the goal to develop structural systems that are efficient and economical. Sustainability which aims to reduce the demands on resources and develop strategies to reduce, treat and dispose/ recycle waste products to enhance resilience, efficiency and livability. Finally, Materials which covers engineering materials as part of infrastructure design, development and management including high performance steel, recycled concrete, geopolymers concrete, composites and nanocomposites.

NUW Alliance's collaborative framework affirms our commitment to deliver impact and benefit for the Six Cities region through outcomes-focused collaborations that push the boundaries of innovation.

WHAT'S NEXT?

“Change and innovation doesn’t happen in isolation, it requires a level of collaboration, cooperation and determination to deliver real world impact and benefit for our communities through the Six Cities Region.

Our vision is to unlock and realise the potential of the Six Cities Region and make it a better place for generations to come. That requires partnership on a scale and of a depth the NUW Alliance is ideally suited to deliver.

It starts with our First Nations people and evolves through inclusive, purposeful, and genuine collaboration.”

Professor Andy Marks
Chief Executive Officer, NUW Alliance



