UOW Submission in response to the Department of Infrastructure, Transport, Regional Development and Communications Consultation paper – 'Regional Data Hub: Understanding and responding to regional data needs'

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INTRODUCTION

The University of Wollongong (UOW) welcomes the opportunity to provide input in response to the Department of Infrastructure, Transport, Regional Development and Communications Consultation paper – 'Regional Data Hub: Understanding and responding to regional data needs'.

UOW uses a wide variety of data to undertake and inform its business operations and conduct research. It also generates a significant amount of data through its business and its wide range of research activities. As a primarily regional University, UOW recognises the power of data and values access to timely, reliable information about the regions in which it operates. It is therefore broadly supportive of government efforts to improve access to a broad range of regional data to regional communities.

This Submission broadly responds to the four areas of the Consultation Paper and the relating questions, these being: How do you use data?; What data do you need?; How do you want to access data?; Do you have data to share?

ABOUT THE UNIVERSITY OF WOLLONGONG

UOW is a leading global university powered by its people, partnerships and communities. Throughout our global network, UOW works together with industry, research partners, governments, communities and other universities to address society's critical economic, environmental, social and medical challenges. Together with our partners we are delivering impact for a better world.

UOW is a global community of learners, researchers, experts and leaders. A benchmark for Australia's new generation of universities, UOW is recognised internationally for the quality of our education, research impact, and industry and community engagement.

A research-intensive university, UOW is an international network of campuses and regional learning centres. In addition to its Australian metropolitan and regional campuses, UOW delivers world-class teaching to students in the United Arab Emirates, Hong Kong, China, Malaysia and Singapore. UOW has formal agreements with more than 400 overseas institutions in 46 countries spanning research collaborations, teaching collaborations, credit arrangements, articulation arrangements, study abroad and exchange programs and offshore program delivery.

As the Australasian member of the University Global Partnership Network (UGPN), UOW's strong international outlook is demonstrated by partnerships with peers and industry, government and community-based organisations across the world.

UOW continues to provide solutions that support emerging businesses and transform existing industries by helping them to adopt advanced technologies and innovative systems. The University is committed to creating environments where entrepreneurship and innovation can thrive so research can be rapidly transferred into commercial products and services.

A dynamic university renowned for being innovative and agile, UOW plays a fundamental role in driving social and economic change in communities across NSW and Australia.

Generating over $2.5 billion in gross output annually, UOW is leading locally by competing globally. Strategic partnerships between the University, entrepreneurs, industry, business and government are accelerating innovation and our transformative projects are reshaping communities, research, education, healthcare and industries for the future. The University continually works closely with its communities to create a positive future from the new opportunities that will arise during the challenging times ahead. UOW inspires a better future through education, research and partnership.

UOW has also developed the Innovation Campus in Wollongong, which is an education, research and technology precinct. This state of the art facility provides strong linkages between business and research, and complements the University's leading research and innovation institutes.

The award-winning research, innovation and commercial precinct contributes enormously to the Illawarra economy each year, helping to activate new economic activity and regional jobs and enhancing the region's competitive edge in the marketplace.

The precinct is home to a number of UOW's multidisciplinary research institutes, along with a well-established community of innovation companies that are strongly engaged with the University, including:

- Australian Institute for Innovative Materials (AIIM) - a key national laboratory for medical and energy material to help transform multi-functional materials research into commercial reality. The multi-disciplinary focus of AIMM brings together biologists, clinicians, chemists, physicists' engineers and materials scientists. AIIM comprises the following research organisations:

    - The Intelligent Polymer Research Institute

    - The Australian Research Council Centre (ARC) of Excellence for Electromaterials Science (ACES)

    - The Institute for Superconducting and Electronic Materials

    - The University of Wollongong Electron Microscopy Centre

- iAccelerate - an incubator for new business start-ups

- The Australian National Centre for Ocean Resources and Security (ANCORS) - Australia's only multidisciplinary university-based centre dedicated to research, education and training on ocean law, maritime security and natural marine resource management

- Sustainable Buildings Research Centre - a 6 Star Green Star- Education Design v1 accredited, multi-disciplinary facility that hosts a wide range of research and industry collaborations to address the challenges of making buildings sustainable

UOW is home to the SMART Infrastructure Facility - a key national laboratory for research on infrastructure. The University is a joint venture partner in the Illawarra Health and Medical Research Institute along with the Illawarra Shoalhaven Local Health District.

UOW COMMITMENT TO CULTURE OF DATA DRIVEN INSIGHT AND DECISION MAKING

Benefits of good data include informed decision making, high quality and evidenced based decision making and public policy and, advancing knowledge for the betterment of society. To achieve this it is important that data is rigorous, relevant and useful. UOW is committed to nurturing an organisational culture of data driven insight and decision making. The University recognises that the application of data science for efficient and

rigorous decision making is becoming increasingly important. In this digital age where data is freely and voluntarily provided by consumers, and organisations such as government departments collect vast amounts of information, the availability, breadth and depth of data that can be collected and analysed is greater than ever before. Nevertheless, for such data to make a social impact requires Big Data platforms supporting data safety, data management, robust and flexible analysis that is critical to enable Big Data to support research implementation and societal impact.

Optimal data management platforms can create significant benefit, including:
- Cost reduction in terms of resources required to collect, store and analyse data; and
- More agile, optimal and efficient decision-making.

In managing big data infrastructure, systems and processes are critical to ensure data is optimally managed. The management of issues such as data privacy and cyber security, data storage and ethics approval are of vital importance to individual organisations, such as UOW and any other organisation or facility which stores or manages data. To ensure its success, the proposed Regional Data Hub will require a strong overarching governance framework and clear vision and set of objectives, as well as a unified approach with users and data contributors.

MAXIMISING UOW DATA SOURCES

In recognition of the value of capitalising on the enormous array of data which it uses and generates, UOW has established a Data and Decision Science Initiative (DDSI). The DDSI is aimed at bringing together a virtual network of researchers and practitioners across UOW, including academics in health and medicine, social sciences, art, humanities and law.

The success of the DDSI depends on a range of factors, including:
- Bringing together, thematically, the best complement of academic and professional staff in data science and analytics;
- Building and maintaining trusting partnerships with key agencies and funders (such as NSW Health), and strategic technology providers; and,
- Designing and building a platform capable of securely integrating, and, robustly and flexibly analysing primary and secondary data to address real world problems with multidisciplinary research.

UOW RESEARCH

Many of UOW's research activities involve major partnerships and collaborations with universities, institutes, governments, industry and researchers across Australia and internationally. This activity generates and uses Big Data, the amount of which is growing and has potential for exponential growth. These partnerships demonstrate the power that data sharing has to educate and make informed policy and business decisions. The success of these partnerships based upon the careful nurturing of relationships between UOW and other agencies with whom we share and use data.

The following table briefly summarises UOW research activity relating to Big Data.

School	Research summary
Australian Health Services Research Institute (AHSRI)	A nationally and internationally recognised centre of health and medical research aiming to improve the management and provision of health and community services in Australia. AHSRI is UOW based and has affiliations across UOW, other universities, the Australian

	health industry, and internationally. Key initiatives include:
	1. The Centre for Health Research Illawarra Shoalhaven Population (CHRISP) - collaboration with Illawarra Shoalhaven Local Health District (ISLHD).
	2. The Australasian Rehabilitation Outcomes Centre (AROC) - collaboration with the National Rehabilitation Medicine Clinical Registry of Australia and New Zealand.
	3. The Palliative Care Outcomes Collaboration (PCOC) - a national palliative care project that has been funded by the Australian Government Department of Health since 2007.
	4. The electronic Persistent Pain Outcomes Collaboration (ePPOC) - a national program which aims to help improve services and outcomes for individuals experiencing chronic pain and has been operating since 2012. More than 80 pain services routinely submit data to ePPOC which holds more than 60,000 individual records.
	5. The Centre for Health Service Development (CHSD) conducts between 10 and 15 health services research projects each year. Many of these projects include receiving and analysing large, complex datasets from the health, community or aged care sectors.
School of Electrical, Computer and Telecommunications Engineering	1. Speech, audio, video, acoustics arrays and datasets. 2. Machine learning/deep learning relating to large datasets of medical images (cancer diagnosis). 3. Health and defence research using large and complex datasets.
School of Mathematics and Applied Statistics	NIASRA (The National Institute for Applied Statistics Research Australia) develops and applies methodologies to use Big Data in a range of applications such as health, medicine, agriculture, bioinformatics, environmental science, and social science. NIASRA has extensive experience in theoretical and applied use of Big Data, and is home to a High Performance Computing facility. The Institute also has well-established Australian and international networks with data providers, users and collaborators. NIASRA is home to a number of centres that use Big Data: • The Centre for Biometrics and Data Science for Sustainable Primary Industries • The Centre for Environmental Informatics • The Centre for Sample Survey Methodology • The Statistical Consulting Centre • The Centre for Health and Social Analytics
SMART Infrastructure Facility	The SMART Infrastructure Facility contributes to infrastructure planning in Australia through independent research coupled with deep academic rigour to ensure policy-makers and industry receives high quality and timely advice on major projects. These projects address key social, economic health, safety and environmental issues. As part of this, SMART has developed Vision Illawarra, a web-based regional dashboard created to enable evidence-based planned and integrated development across the Illawarra, more information about Vision Illawarra is provided later in this Submission.
CryoEM at Molecular Horizons	CryoEM at Molecular Horizons produces up to 4TBytes per day of data and utilizes the high-performance resources available at Monash's MASSIVE data centre to perform analysis.
School of Earth, Atmospheric and Life Sciences	1. Large and complex datasets from satellite observations of earth (3D model outputs). 2. Large and complex datasets for compilation of geological, geophysical and geochemical data that are globalin scale and time dependent. Plus time-dependent global models of past tectonic motion and flow within the Earth (Dynamic Earth Models).
School of Education	Big Data in education research (in collaboration with SMART).

PowerLab, School of Health and Society	Population Wellbeing and Environment Research Lab Public Health research including but not limited to research relating to: • Hospital emergency presentations, colorectal cancer patients and other patient diagnoses. • Longitudinal studies of child development, 45 and Up study. • Research using Australian Census data. • Medicare Benefits Schedule, Pharmaceutical Benefits Scheme, hospital data. • Household Income and Labor Dynamics in Australia (HILDA). • Various environmental datasets e.g. food outlets, green space, walkability and air pollution.
School of Psychology	• Research relating to suicide risk (health and non-health related data, e.g. transport). • Collaboration with CHRISP on methamphetamine presentations and datasets. • Pediatric psychology research. • The Human Connectome Project. • Collaboration with UQ on the Atlas Project.

UOW is also involved with significant collaborations such as NUW Alliance, an agreement between the University of New South Wales, UOW, the University of Western Sydney and the University of Newcastle, which aims to explore, develop and deliver collaborative opportunities that make a difference where the benefits are greater than the sum of each University working separately.

Due to limitations, UOW's research data does not present a single interface to other agencies, such as State Departments, local health districts, nor other universities for its research. Rather, individual research groups and centres have independent relationships with these agencies but nothing that resembles a unified approach to nurturing the 'trusted partnerships' that the custodians of Big Data clearly value. The biggest barrier to presenting an effective single UOW interface with agencies is the absence of a data platform, personnel and a mandate to share access, analysis and translation of Big Data and health informatics across the institution.

RESPONSES TO CONSULTATION PAPER QUERIES

HOW DO YOU USE DATA? WHAT DATA DO YOU NEED?

Consultation Paper Questions

• What are the major types of data (economic, social, industry, demographic) that you use?
• Are there particular sources (eg. Government) that you would prefer to receive data from?
• Would you like to access data by a particular area or location? Examples are by local government area, Indigenous Regions or the Australian Statistical Geography Standard (ASGS)
• What other information could be included in the Hub, including for release as regular Hub products?

UOW Response

UOW uses and produces an enormous amount of data across its various operations. For example, data is used to inform market research, such as student recruitment, anticipating market demand and opportunities in certain geographical areas (regional, urban and internationally). Specific operational related data is also produced by

a wide range of areas of the University, much of which is then provided to meet specific government reporting requirements, such as student population data and financial reports.

UOW accesses data from a range of sources such as the Australian Bureau of Statistics (ABS), the My School website, (by the Australian Curriculum, Assessment and Reporting Authority, the Universities Admissions Centre (UAC) and Austrade.

Any type of demographical data about regions is valued by the University. Of the data detailed in Table 1 on page six the Consultation Paper, UOW would find all types of data lists to be of interest and use. This includes education (Arts, Telecommunications, Health outcomes, Tourism), housing supply (internal/ overseas migration, ageing, population density, ethnic diversity) and transport (skills supply, drought, jobs, property development). It is useful to be able to see this data in as many areas or locations as possible, including local government areas, Indigenous regions and the ASGS.

The availability of useful government data made available for public use to inform many of UOW's business decisions has improved over time. In some circumstances there is data available, but the availability of data is unknown to potential users. It would be useful for government data to be more clearly communicated so that potential users, such as UOW, are aware of what is available. It is also noted that the cost of accessing some data-sets can be a barrier to access of potential users. This includes some data-sets available through the ABS, in addition to other government and private sources.

HOW DO YOU WANT TO ACCESS DATA?

Consultation Paper Questions

Data Use

- How do you currently access regional data and information?
- What other ways would you prefer to access regional data and information?
- What tools or products would help you to access and use data (eg. A dashboard, user generated reports, maps, raw data)?
- What features would you like to see as part of the Hub to improve your access to regional data?

UOW Response

UOW accesses regional data and information is a variety of ways depending on the data sought and the area of the University seeking it. Some data is sent to the University, whilst in many circumstances users will proactively look for data primarily online. Whilst data is useful in all formats mentioned, such as interactive maps and other pre-populated forms, UOW strongly emphasises the enormous benefit of having access to raw data, as it allows users to generate reports and use data to meet individual needs.

From UOW's perspective, the provision of real-time data is always particularly helpful, particularly in helping to inform organisations in this period of rapid and unanticipated change. For example, it is noted that government real-time data about the COVID jobless data has been a useful tool since it was introduced in 2020.

In the many circumstances where real-time data is not available however, the University emphasises the need for data to be provided as quickly as possible to ensure it is as helpful and relevant to users. It also emphasises the need for the longevity of consistent data sets (not just three years) to allow for improved decision making and comparison of changes in data over time.

It is also noted that, whilst regional specific data is valuable, having access to state-wide and national data (both regional and urban areas) is important to allow for differences between different geographical areas to be identified.

Barriers to access regional data

- What barriers prevent you accessing data?
- How could the Hub make it easier for you to access data?

UOW Response

The University currently accesses a range of Government information to help inform its business decisions, however, as already stated, there are often circumstances where potential users are unaware of government data which is available. It would therefore be beneficial for government information to be sourced more centrally or, to have details about the range of information available to be clearly listed in a central point so that users are aware of what information is available. Making data free wherever possible is of significant benefit to users and would likely increase the use of data among users in regions, particularly researchers, smaller businesses and individuals.

DATA SHARING OPPORTUNITIES

Consultation Paper Questions

- What regional data do you hold?
- What data (either your own or other data) would you like to see shared through the Hub?
- What are the greatest barriers to sharing data (either your own or other data) and how can these be overcome?
- What would be the benefits of greater data sharing for you or your organisation?

UOW Response

UOW and its associated research facilities have a lot of data across a range of discipline areas, much of which relates to regional areas. Whilst not an extensive list, a brief overview of some of UOW's research activity is already outlined in this Submission. It is noted that only minimal detail about the relationships which exist within these research activities involving data sharing is provided here. The University would be happy to provide more detail about specific projects and the data involved at the Department's request however.

Other data which UOW holds includes information about its business operations, including research income and output, financial and student demographics information. A significant amount of information about UOW's business operations are reported routinely, as required by relevant legislation, to state and government agencies, including the Federal Government of Education, Skills and Employment, the NSW Department of Education, the NSW Audit Office, the Australian Universities Quality Agency and the ABS. Data submitted is generally prepared to meet specific reporting requirements however, and is therefore not in raw data format. Much of this data is made publicly available through the individual departments and agencies.

Examples of effective data sharing collaborations which the University is involved include:

- Australian Health Services Research Institute (AHSRI) (https://www.uow.edu.au/ahsri/) - is a major research facility at the UOW which brings together six research centres: The Australasian Rehabilitation Outcomes Centre, the Centre for Health Research Illawarra Shoalhaven Population; The Centre for Health

Service Development; the Electronic Persistent Pain Outcomes Collaboration; the Ngarruwan Ngadju First Peoples Health and Wellbeing Research Centre; and, the Palliative Care Outcomes Collaboration.

AHSRI aims to improve the management and provision of health and community services in Australia by achieving greater equity in resource distribution, fairer access to services, better continuity within and across the health and community care sectors, and the use of evidence to assist management decision-making. AHSRI has affiliations across UOW, other universities, the Australian health industry, and internationally. AHSRI's strong and productive partnerships across the health sector, including with our local health district, make an enormous success to the research outcomes in produces.

- Vision Illawarra (https://visionillawarra.org.au/) - is a web-based regional dashboard created to enable evidence based planning and integrated development across the Illawarra. Vision Illawarra's comprehensive dashboard comprises publicly available data including recent economic, demographic, transport and land use figures, as well as the evolution of utility usage over the last ten years (water, electricity, wastewater and solid waste). This data is regularly updated, allowing for robust benchmarking and spatial analyses.

Vision Illawarra arises from a regional initiative which partners data providers (Sydney Water, Endeavour Energy, Remondis), tool developers (SMART Infrastructure Faculty, RIKS) and information users (NSW Planning, Local Councils) within a Steering Committee that examines data privacy or security issues, and proposed new regional scenarios to be modelled.

The success of Vision Illawarra is largely dependent on good governance and the ongoing careful management of the relationships of partners.

As already noted, UOW's experience is that, generally, the level of useful state and regional data to help inform business decision making continues to improve with time. In regards to general information, for UOW's purposes it would be beneficial to receive more detailed information about anticipated population growth in regional and rural areas, including migration numbers. It would also benefit from access to information about businesses operating in the same regions as it. Details about Federal and state government funding/projects in regional areas would be useful, as such activity can significantly influence the future demand for particular education/qualifications in specific regions. This would allow the University to plan for courses to be offered in certain regions and staffing allocation for these courses to meet market demand and ensure adequately skilled workforces to help fulfil these projects. It is acknowledged that some of this desirable information is more qualitative than quantitative however and may therefore not be within the scope of the proposed Regional Data Centre.

Data sharing can have significant benefits, including greater connection and collaboration which can help aid in more informed decision making there are a range of issues which impact upon the University's ability to mutually share various amounts of this data.

UOW's ongoing involvement in many research activities is dependent upon it being a trusted data partner who upholds the protection of data privacy. This includes the manner in which personal data is handled throughout the information lifecycle: from the initial decision to collect personal data, through to the security of that data during storage and the ultimate destruction of data when it is no longer needed. In addition to its own and governance arrangements, UOW ensures that it manages data in accordance with relevant Federal and state legislation.

One of the main areas of concern are the legal and ethical requirements of sharing data which has been obtained for specific purposes. For example, much of UOW's researchers collect data for their own research purposes. Sharing this data would require navigating privacy concerns and ensuring ethical matters are considered and addressed. As much data collected by researchers is collected with informed consent as to its usage; to share data would add significant layers of work to researchers, such as researchers needing to gain signed consent for it to be shared elsewhere.

There are a range of other issues which would impact UOW's ability and willingness to share data, particularly with regards to data gathered for research purposes.

Whilst all research conducted using Big Data must comply with UOW Human Research Ethics Committee requirements for data storage, privacy and security, the absence of a University data platform, particularly in the context of health data, places a material constraint on sharing data among teams in the University, let alone externally to the University.

In other cases, where massive amounts of data are generated locally the main challenge is:

- Managing data growth in terms of suitable storage and structure;
- Keeping data meaningful;
- Implementing appropriate tools for efficient analysis and insight;
- Recruiting and retaining expertise in an area where demand is outstripping supply of big data experts;
- Integration of disparate data sources and data formats;
- Cleansing and validation of data (quality assurance) – To allow data to be shared would also require it be cleaned up so that it can be used in a different, shared setting. This would add another very time consuming layer of work to many researchers; and
- Ensuring security and privacy of data.

Other issues of relevance to data sharing include commercial in confidence concerns. For example, to share some UOW specific data would risk sharing important competitive information. It is also noted that, given the uniqueness and complexities of individual data sets will require specialist knowledge to correctly interpret.

A highly effective Governance Framework would be required to manage the proposed Regional Data Hub, to ensure that these issues are addressed and constantly managed. The building and maintaining of trusting relationships with all relevant stakeholders, including all data owners, is also critical. A commitment for the Regional Data Hub to employ a FAIR (Findable, Accessible, Interoperable, and Reusable) model to research output data (https://www.fair-access.net.au/fair-statement) in line with international practices is recommended.

SUMMARY

The effective use and management of data has enormous potential to assist private business and government agencies to make business decisions and help guide the development of informed policy.

UOW acknowledges the enormous benefits of data sharing, as evidenced by many of its relationships with research partners and other activities, and is therefore broadly supportive of the development of the proposed Regional Data Hub. Regional business and government agencies can only benefit from the availability of more regional data.

In developing the proposed Hub, the University emphasises the need for the Federal Government to clearly define the aim and objectives of the Hub, to develop an overarching governance framework which seeks to address data management issues identified in this Submission, as well as engage closely with stakeholders to gain their support and involvement to ensure the scope of the Hub is manageable whilst still providing value to users.

Given limitations, it is likely that some data may not be suitable to include as part of the Hub. In such cases however, it is suggested that the Hub also look to include details of other data available from other sources.

Universities are a very big users and generators of data in regions. UOW urges the Department of Infrastructure, Transport, Regional Development and Communications to liaise closely with UOW and other relevant universities in the development of this proposed Hub to help ensure it maximise its potential.

FURTHER INFORMATION

The University would welcome further opportunities to elaborate upon, or further clarify, the matters raised within this submission. To do so, please do not hesitate to contact the UOW Director, Government Relations (Mr Canio Fierravanti) on Ph - 42215931 or via Email - caniof@uow.edu.au.