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Australian Academy of Science submission to the *2026 National Research Infrastructure (NRI) Roadmap Exposure Draft*

This section responds to the consultation question:

Q16. Please add any other feedback you would like the Roadmap Expert Working Group to consider.

Australia's NRI system underpins the nation's ability to conduct high-quality research, collaborate internationally, foster innovation, and respond to complex national challenges.

The Roadmap presents a broad, aspirational view for the direction of Australia's national research infrastructure over the next five years. However, it does not recognise the critical 2028-29 funding cliff facing the National Collaborative Research Infrastructure Strategy (NCRIS).

The Academy calls for an urgent, formal commitment from the Australian Government to continue to fund NCRIS at no less than current levels beyond 2028-29. This program creates more than 1000 jobs and provides more than 100,000 Australian researchers and 30,000 international users access to more than $4 billion in tools, data and expertise.

The Academy welcomes the findings in the NRI Roadmap exposure draft and supports its proposals for coordinated national high-performance computing and data infrastructure, supporting a skilled workforce and Australia's research collections. The Academy further recommends that the phased approach to collections sets clear timeframes for each phase and considers identifying pilot collections of national significance that could be brought to higher levels of maturity.

The Academy looks forward to seeing clear, actionable, timely recommendations in the final Roadmap.

The Academy recommends the final NRI Roadmap:

- Include critical landmark and international research infrastructure in its long-term strategic planning of Australia's research infrastructure and international partnerships.
- Develop a long-term integrated approach to international research infrastructure
- Adopt a coordinated formal partnership model between state and territory governments to leverage regional strengths and connect Australia's research infrastructure.
- Commission a 10-year national high performance and computing (HPCD) strategy, inclusive of the necessary workforce and incorporating GPU, CPU and data storage and access needs and requirements.
- Recognise the role of fundamental research to translation across disciplines. Translation will not exist without the research pipeline.
- Create administrative and governance frameworks across funding schemes to set clear responsibilities, decision points, lifecycle costs and measures of success for each near-term coordination priority.
- Develop measurement and reporting requirements of NRI facilities to ensure they are meeting their obligations.
- Set clear timeframes for the phased approach of collections, safeguarding these national assets while coordination and governance arrangements are created.
- Establish a national coordination capability for national research collections, providing national oversight to identify approaches, opportunities and coordination across collections, data sets, platforms and enabling services.

This section responds to the consultation questions:

Q2. Where are the opportunities to strengthen the analysis of the global context and how could they be addressed?

While the Academy supports the exposure draft's proposed analysis of how landmark facilities, such as the Australian Synchrotron and Research Vessel (RV) Investigator, connect to the broader landscape, further clarification should extend to how the different tiers of infrastructure have been included in the Roadmap. This analysis should extend to Australia's participation in international infrastructure such as the Square Kilometre Array (SKA). This international analysis would recognise the scale of infrastructure required to support research and innovation into the future such as exascale computing.

The Academy recommends developing a long-term integrated approach to research infrastructure planning, to enable targeted investment in critical international partnerships. Greater strategic coordination between tiers of infrastructure would strengthen Australia's position as a trusted research partner, enhancing our ability to contribute to and benefit from major multinational initiatives such as Horizon Europe. Leveraging our existing capabilities and supporting talent mobility and knowledge exchange would maximise impact and efficiency of Australia's research infrastructure investments.

Q3. Where are the opportunities to strengthen the analysis of the current state in Australia, and how could they be addressed?

Landmark infrastructure is not always supported by national science agencies, and its establishment and ongoing operation often depend on bespoke arrangements negotiated outside existing programs including directly with government departments. International research infrastructure is frequently the principal means by which Australia meets its national research infrastructure needs, giving Australian researchers access to facilities, data and expertise at a scale that could not be feasibly replicated domestically.

These arrangements rely on sustained membership, subscription and partnership commitments, and they require planning horizons that extend well beyond Federal Budget funding cycles.

The Academy recommends the Roadmap commit to cohesive longer term funding horizons for international memberships, subscriptions and partnerships that national capabilities rely on.

The Academy is concerned that the anticipated removal of the Australian Research Council's (ARC) Linkage Infrastructure, Equipment and Facilities (LIEF) and replacement with Collaborate: Infrastructure, Equipment and Facilities (CIEF) programs, noted in the National Competitive Grants Program (NCGP) review report will reduce support for research infrastructure and add to the pressure already facing the sector.

The NCGP review of the ARC funding model will reduce support for research infrastructure and will have flow on effects to how some research projects will be able to be funded. For example, minor equipment costs could be covered under standard project grants such as Discovery or Linkage projects, but LIEF has supported mid-scale, collaborative infrastructure that sits below the threshold of national investment but beyond the capacity of single institutions and has often provided the co-investment that underpins access to larger facilities. The capacity of individual institutions and the co-investment in these partnerships have been further eroded by the gap between the funding provided by the research Support Program and the level of research it is designed to support. Without further infrastructure support, and the NCRIS funding cliff looming, there is a risk that further gaps will emerge in the infrastructure pipeline resulting in both the erosion of existing capability and the lack of opportunity for replacement and renewal of capability with more efficient and effective technologies. The final Roadmap must present a whole-of- government solution to sustaining the research infrastructure needs of the country.

The final NRI Roadmap should consider adopting a coordinated formal partnership model, that can integrate and attract funding commitments from state and territory governments, and that better leverages business and other government investments. This would serve to coordinate investment across jurisdictions, leverage regional strengths and address diverse research and innovation needs across Australia, providing further integration across the layers of infrastructure.

This partnership model could serve as a blueprint for the National Strategic Initiatives proposed under the pillar model in Ambitious Australia. This model, together with Ambitious Australia's recommendation for reforms to the Research and Development Tax Incentive scheme would provide further support and maximise Commonwealth and business investment.

Q5. What opportunities do you see for more effective coordination or integration among NRI facilities?

The Academy recommends the NRI Roadmap consider future planning and coordination in light of the NCGP review report, including how support for infrastructure previously funded through these programs will be maintained, and how investment can be coordinated fairly across state boundaries to ensure Australia's research system remains well equipped.

The Academy proposes that the final Roadmap build an integrated long-term NRI system that connects institutional, national, landmark and international categories of research infrastructure, including NCRIS, ARC programs and infrastructure in Federal and state agencies. Each of the four categories of research infrastructure is supported through different funding programs and mechanisms, and the Roadmap should clearly recognise these differences.

This section responds to the consultation questions:

Q8. AI is impacting research practices in all domains. What are the implications for how we should plan and prioritise national research infrastructure?

The Roadmap should prioritise compute, data, workforce and AI as complementary arms of research infrastructure, and the phased approach to the national model should reflect this. The exposure draft's phased approach to high-performance computing in section 6.2 does not yet fully address the scale, demand, or pace of this technology's evolution. The proposed phases do not reflect the draft's own acknowledgement of the urgency of HPC and runs in sequential order, with designing and governance in phase 2 and the investment model in phase 3. The proposed phased approach risks HPCD facilities ageing out before the next tranche of funding arrives, leaving Australia with diminished national capacity.

The Academy recommends the Roadmap commit to a 10-year national HPCD strategy, covering GPU, CPU and data storage and transmission needs, as a matter of urgency. The phased approach described is important but will not fully address how private and public compute can best work together to support Australian researchers and research in the Australian interest including that undertaken by the Australian Government.

The Roadmap should set out a model that could be adapted to work under a partnership arrangement between hyperscale and data centre operators, enabling these companies to play an active role in contributing to local R&D capability development as outlined in the Academy's submission to the Office of AI consultation on AI infrastructure 'Getting it right: Building AI infrastructure that works for Australia'.

Per the Academy's submission, the favourable terms being negotiated should include a 5-10% allocation of compute capacity for publicly funded research purposes, and/or a discounted rate of 25-50% for non-commercial Australian research. Access to any reserved compute provided by private providers must be delivered through a single national merit-based allocation process, such as that offered by the National Computational Merit Allocation Scheme and be directed through the national model for HPCD being presented in the exposure draft. The Office of AI has described a potential 'public-interest research payment' and as part of tit's proposal, the Academy has recommended a 2.5% levy on revenue from data centre operators, frontier AI developers and hyperscalers. This money would be invested in public compute and supplement the Australian Government funding.

Sector coordination, planning and investment for HPCD and AI must be done in tandem to allow Australia's computing infrastructure to keep pace with demand, technology refresh and the pace of change.

Q11. In the descriptions of any of the capabilities, are there key aspects that have not been mentioned?

Longitudinal demographic, clinical, cognitive, behavioural and imaging data are essential for understanding development, ageing and mental health. These data sets should be maintained securely in Australia, with clear governance and privacy protections. Doing so would allow better linkage across the health and education portfolios, and social and administrative data would strengthen the evidence base for national policies.

The Academy recommends a coordinated strategy with sustained investment in GPU-enabled hardware, nationally significant datasets and the expertise needed to use them, to position Australia to capture the full benefits of AI for research, industry and the broader community. The rapid growth of commercial artificial intelligence has driven up hardware costs and placed university-based Tier 2 facilities under considerable pressure. These facilities remain essential to the national system; they support innovation and experimentation

and provide critical training for the next generation of computational researchers and technical specialists. A nationwide strategy for HPCD would provide sector-wide benefit, linking the skilled workers needed for delivery and assisting Australia's existing Tier 1 systems that are in heavy demand and overly subscribed.

Q13. Do you have any comments on the proposed integrated national approach to HPC?

The Academy supports the Exposure Draft's proposed integrated national approach to HPC, including unified, merit-based access across Tier 1, Tier 2, cloud and commercial providers. The Academy proposes that the final Roadmap bring forward the phased approach to computing, and present HPC and data as a connected infrastructure ecosystem supported by a skilled workforce. For example, ocean and climate modelling through the National Computational Infrastructure is critically dependent upon input concerning key processes from experiments in fluid dynamics laboratories established and maintained as part of institutional infrastructure. HPCD planning must incorporate the use of infrastructure across institutional, national and landmark categories and must ensure these uses are reported to ensure accurate future planning activities. Australia's international peers including China, the United States and Europe already operate exascale capabilities. Delaying a connected HPCD ecosystem risks Australia's capacity falling further behind the demands of modern research.

The Academy recommends a national strategy for high-performance computing and data. This strategy should link HPC planning directly to the draft Roadmap's call for sovereign domestic compute and access to Australian focused foundation models, and should treat compute, data and a skilled workforce as interdependent components of a single capability. This strategy and future investment plan should address the full computing ecosystem, rather than focusing on compute capacity alone.

Q14. Do you have any comments on the proposed phased approach to collections?

We welcome the Exposure Draft's recognition and attention to collections as one of three domains of national importance and its characterisation as a near term priority. The Academy recommends the Roadmap set clear timeframes for the phased implementation of research collections, including interim measures to safeguard collections of national significance, and maintaining their condition and accessibility.

These collections hold irreplaceable record of Australia's history and landscape, and their value is tied to the continuous care and expertise that cannot be easily built.

The Academy further recommends that the final Roadmap identify pilot collections of national significance to showcase how collections can mature in digitisation, data standards and interoperability. Piloting these sample collections would enable early and practical evidence of what works, enabling streamlined operability and rollout across the wider collection network.

The Academy further recommends establishing a National Research Collections Coordination Capability as a permanent, light-touch national function within the broader NRI ecosystem. Its functions should include:

- maintaining a national view of significant research collections, platforms, datasets and enabling services; including culturally significant research infrastructure providers such as galleries, libraries, archives and museums (GLAM).
- identifying opportunities for shared infrastructure, interoperability and investment;
- supporting common approaches to metadata, discovery, persistent identifiers, provenance and data linkage;
- coordinating workforce development, professional networks and access to specialist expertise;
- supporting Indigenous-led governance and culturally appropriate access where First Nations knowledge and data are involved; and
- providing advice on national priorities, gaps, dependencies and investment opportunities when it comes to nationally significant collections.

This section responds to the consultation question:

Q1. What additional elements of 'what good looks like' should be considered in the future design of the NRI system?

While the Academy supports the exposure draft's focus on translation, this pipeline is dependent on a strong foundation of fundamental research and translation will not exist without this foundation. National planning should identify and sustain the capabilities needed for internationally leading research, including emerging scientific opportunities. The Academy proposes that the final Roadmap advance industry access and translation alongside fundamental research and public good uses, to complement rather than compete. The final Roadmap should showcase a strong emphasis on research excellence as an explicit principle guiding future infrastructure prioritisation.

The Roadmap should recognise fundamental research and discipline-based capability as powerful sources of transferable technology, specialist expertise, innovation and national resilience. Research disciplines with mature, large scale data infrastructure, such as astronomy could be positioned as a national testbed for data-intensive research, AI and cross disciplinary innovation across all categories of infrastructure. This discipline requires sustained processing, storage, networking, data movement and long-term curation. For example, through Astronomy Data and Computing Services (ADACS), this expertise is supporting other NCRIS capabilities including Integrated Marine Operation System (IMOS), Australia's Terrestrial Ecosystem Research Network (TERN), the Atlas of Living Australia and Phenomics Australia, demonstrating how specific investment can benefit cross cutting discipline benefits in marine observation, climate science, phenomics and space research.

The Academy recognises that Government investment alone cannot meet the expanding needs for NRI investment in Australia. As noted in the Academy's December 2025 submission to the Roadmap process, opportunities to grow investment in research infrastructure and deepen research-industry partnerships should be considered, including private public partnerships and superannuation capital as a source of investment in NRI. Integrated partnerships of this kind create pathways for industry engagement, innovation translation and workforce development.

This section responds to the consultation questions:

Q4 What opportunities for change to current national planning and prioritisation approaches do you recommend for consideration?

Improved governance must extend across the funding schemes that support research infrastructure. The Academy and its National Committees for Science have expressed concern about the lack of coordination between these schemes, including the future of the ARC's LIEF scheme. The 2027-28 analysis should examine how NCRIS, CIEF, National Health and Medical Research Council (NHMRC) and Medical Research Future Fund (MRFF) infrastructure funding align. That analysis should lead to a framework that establishes transparent criteria for assessing proposed investments and managing delivery. The framework should support the active management of investment across the infrastructure lifecycle, from establishment and operation through to refresh, consolidation or decommissioning.

Q6. What specific opportunities for improved coordination between funding schemes do you recommend should be subject to further analysis in 2027-28?

The Academy recommends a coordinated national model that aligns research funding with national priorities. Ambitious Australia developed this model, and the Roadmap should adopt it to allow coordination across isolated funding schemes. Australia's research funding is spread across many separate schemes that are not aligned to the same set of priorities, leading to duplication, gaps between programs and differing governance mechanisms. The pillar model was proposed to address these concerns.

Under the Ambitious Australia proposed pillar model, NHMRC and MRFF investment would support the Health and Medical pillar, and the rural Research and Development Corporations (RDC) model would support the Agriculture and Food pillar. The Australian Renewable Energy Agency (ARENA) and CSIRO would inform the work of Environment and Energy pillar. Resources would likely be supported through CSIRO, ANSTO and Geoscience Australia, and critical technologies such as AI and quantum would sit under the Technology pillar. Using the national innovation pillars, guided through a National Strategy Advisory Council and National Innovation Council would reduce duplication, improve governance and coordination across the research sector.

Q15. Please add any feedback on the draft findings you would like the Roadmap Expert Working Group to consider.

The Academy proposes the final Roadmap improve the governance, planning, and administration of NRI to establish clear and open access arrangement, responsibilities, decision points, measures of success and coordinated sector planning. Each recommendation drawn from the 14 draft findings should identify a responsible body, a timeframe, the resources required and how success will be measured and reported. The Academy recommends the Roadmap uplift the publicly available measurement of facility usage and demand to inform infrastructure planning. The Roadmap should also clearly outline the process for determining ongoing need of facilities, including pathways to wind down or decommission. These recommendations, met through regular review points across facilities lifecycles, would directly respond to the Australian National Audit Office's May 2026 audit of NCRIS, and enable Government, facilities and research users to track whether the Roadmap is delivering its intended outcomes and to enable capacity planning of the sector.

These decisions must be informed by evidence of ongoing needs and performance and should be underpinned by robust governance arrangements, providing accountability across government, facilities and research institutions for independent review and public reporting. This strengthened framework would provide confidence across investment decisions and allow for responsiveness to emerging scientific and national needs.

To discuss or clarify any aspect of this submission, please contact Lauren Sullivan, Science Policy and Advice Manager at science.policy@science.org.au .