

2016 National Research Infrastructure Roadmap Response



We broadly support all nine recommendations of the Draft Roadmap, especially Recommendations 2, 4, 5, 7 and 9.

We particularly endorse the use of expert facilitators for effecting implementation, the proposal to establish a national research infrastructure governance structure, and an active ongoing planning framework for research facilities.

We urge the Chief Scientist and the Expert Working Group to consider advising on appropriate funding sources and mechanisms in line with the recommendations of the Research Infrastructure Review (the Clark Report).

We support the proposed principles-based approach to future decisions about national infrastructure investment (p.15), and broadly support the nine key focus areas as the basis for framing future research infrastructure investment needs.

We also make the following points:

- 1) Emphasis needs to be drawn to the great and largely under-utilised research potential of our biomedical research precincts, demonstrating various examples of remarkable co-location of:
 - hospitals, with patient cohorts, and very significant scientific instrumentation that has been funded by state governments with a partial remit for research (on top of the more obvious remit for the provision of healthcare);
 - medical research institutes, with outstanding researchers and research capability, often in highly focussed areas;
 - publically funded research organisations (such as ANSTO, CSIRO, AIMS etc);
 - Universities with teaching and research agendas, and significant research capability;
 - Harnessing large health data sets and extensive, complex health records with secure digitisation and data warehousing of medical data.

Striking examples that represent great potential are the Camperdown and Westmead precincts in Sydney, and elsewhere in Australia. Consideration should be given to how we

properly harness the enormous prospective power of collaboration within and between these precincts to produce research that is truly at the scale and focus required for the 'Healthy Australia' national research priority. Specifically, consideration should be given to whether certain goals could be set for individual precincts in the areas of research infrastructure support and sharing.

- 2) We welcome the emphasis on *Digital Data and eResearch Platforms*. We strongly support the notion that digital infrastructure can be built via the integration of national, state and institutional investment. Delivery of digital infrastructure services ought be hard-linked to organisations and/or individual research facilities rather than exist separately in a multitude of below-scale organisations. We advocate for:
 - An integrative approach for this investment that puts the individual researcher or team at the centre of considerations, and explores how their data archiving, curation, digitalisation, and data analytics needs will be met. This could best be achieved via a series of linked national networks that are embedded in our existing research organisations such as Universities. Critically, any approach must place sustainability at forefront of considerations;
 - A rigorous evaluation of the proposed "Australian Data Cloud", including the development of a business case that has been competitively assessed against commercial offerings. We acknowledge this requires proactive governance and investment consolidation to meet researcher needs and encourage industry investment;
 - Consolidation of eResearch and HPC investment which enables researchers from all fields to access and share resources and data across all platforms, including commercial services. Governance and access for this investment needs to be focused around the requirements of individual researchers and projects;
 - Participation in global eResearch capabilities. The scale of some HPC and cloud facilities overseas provides capabilities that cannot reasonably be met in Australia; for example, certain supercomputing facilities.
- 3) We see value in focusing on the coordination and integration of access via a single platform for HASS based research. We suggest the creation of HASS platforms on existing instructional-level foundations will only be viable if there is confidence in a long term funding model for all digital assets. We support dedicated funding for digitisation infrastructure and a coordinated roadmap of institutional planning to avoid duplication
- 4) With regards to the focus area of *Characterisation*, we agree that the next stage for microscopy infrastructure should include atomic scale microscopy, cryo-electron microscopy and high sensitivity microanalytical tools. In each case, an efficient way to deliver Australia's microscopy needs is via a grid consisting of high-end 'flagship' platforms and associated technical experts in strategic locations, supported by mid-range tools that feed into these high-end instruments. We believe that the AMMRF is best placed to implement the national grid for the new microscopy capabilities, having a demonstrated successful collaborative model that is widely agreed to be world-best practice.



- 5) We agree with the priority around *Advanced Fabrication and Manufacturing* and support the notion that there are burgeoning opportunities for Australia to achieve meaningful innovations within and across the spaces of particular materials, component design, device prototyping and integration into viable devices, instruments and machines. As above, this goal will be best-served via a national grid of capability such as ANFF because this organisational structure is mature, inclusive, and allows a sensible balance between the need for certain one-of-a-kind strategic specialisation, and the more tactical capacity-driven duplication of other critically important world-class resources.
- 6) We support the priority around *Environmental Systems*, and advocate for an organisational meta-structure that facilitates coordination. For example, environmental observations ought be made at scales relevant to all relevant disciplines, and be publicly available on data services that maximise the opportunities for analytics. We advocate:
- incentives for coinvestment, whereby institutions and states can leverage infrastructure for achieving the highest possible impact;
 - integration with eResearch and HPC investment through researcher focussed, discipline led projects, which enhance the use of hardware and make the interface with industry work more efficiently.
 - implementation of a Data Translation services capability working across TERN, AusCope and IMOS to consolidate and efficiently ensure the translation of data into useful knowledge;
- 7) Table 2 (p.23) of the draft roadmap is very useful. We consider two National Research Infrastructure Focus Areas, *Platforms for Humanities, Arts and Social Sciences* and *Characterisation*, contribute across all of the National Science and Research Priority areas and that the table currently under-represents their importance.

