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Draft 2016 National Research Infrastructure Roadmap Submission – UNSW

The University of New South Wales welcomes the Draft Roadmap and its Key Recommendations as the outcome of a very constructive and positive process of consultation and planning. We are generally very supportive of the Framework and the Focus areas identified in the report. We have the following comments and suggestions:

(i) The **national governance framework** is strongly endorsed by UNSW. This must contribute to a long-term, strategic whole of government approach to research infrastructure and the innovation it supports.

In addition to the proposed high-level group providing independent expert advice, we suggest that there are some critical areas where more directed coordination or working groups are desirable to ensure that the integration and cross-disciplinary targets identified in the Roadmap are given high priority and support on an ongoing basis. Two examples are:

a. Characterisation, Fabrication and Computation (HPC/Data): We welcome the recognition that the Characterisation infrastructure networks and landmark facilities underpin many of the national priorities. Stronger engagement across these capabilities, and with fabrication and computation, would greatly strengthen the impacts that could be achieved.
b. Health: Health as a national priority aligns with almost all of the infrastructure focus areas, particularly Complex Biology, Therapeutic Development and Biomedical Imaging (Characterisation), as well as having a major dependency on Data/eResearch capabilities.

(ii) While **skills and career development** are given prominence in the Draft Roadmap, we feel that the importance of developing and sustaining a highly skilled research infrastructure workforce should be included as one of the National Research Infrastructure Principles (p. 15).

(iii) **Access** based on merit principles is important. Meritorious research should be defined to include research with high potential for translation and impact, as well as academic excellence. Barriers to access can be greatly reduced by providing modest funding to support new users and pilot studies in new areas of application.

(iv) Broadly, we support the nine **Focus Areas** and are pleased to see a stronger focus on some topics mentioned in our previous submission, such as bioengineering, agriculture and translation of research. We also support the inclusion of 'omics under "Complex Biology" but recommend adding "genomics" alongside proteomics and metabolomics in Table 10.

(v) **Table 2 – Alignment of Priorities and Focus Areas.** We suggest that **Characterisation** also needs to be linked to **Energy** – many areas of energy R&D are dependent on new advanced materials and their characterisation, ranging from next generation photovoltaics to more efficient transmission lines.

(vi) We agree that a national integrated approach to **HASS infrastructure** is vital and that adherence to the FAIR principles should be a priority here and in general, with particular emphasis on facilitating international interoperability and research collaborations. It will be important to build on existing capabilities and expertise, including in disciplines that extend beyond HASS (such as public health and law) in order to achieve the ambitious targets set for HASS. This will require governance and planning structures that continue and are resourced past an initial facilitation phase.

(vii) We welcome the emphasis on **standards and accreditation**. The national infrastructure framework provides an opportunity for Australia to address the issue of research data quality in a coherent way. The nationally funded capabilities should provide leadership and be resourced to implement the appropriate quality / standards environment for the research they support.

(viii) With regard to **eResearch and HPC capabilities**, we have the following comments:

a. We strongly support the framework implied in the **Definition of National Research Infrastructure** and Figure 1 (p. 13). This model both emphasises the peak facilities and recognises the role of precursor institutional facilities. It recognises that the scale of platforms and support teams required for data management, Cloud Computing and High Performance Computing has grown beyond the capabilities of many of the medium-sized institutional and state-led facilities.
b. We strongly endorse **integrating the governance of the Tier 1 HPC facilities** and see value in having several large (top 500) systems which are able to be refreshed in a coordinated cycle.
c. While we broadly support integrating **existing 'Data Cloud' capabilities** (ANDS, NeCTAR and RDS), we suggest that future investment in physical infrastructure needs to be seriously evaluated. Investment plans which allow for outsourcing to commercial providers and developing agreements to benefit the whole sector through aggregated (discounted) pricing structures and common contracts must form part of the national strategy. We also suggest that computing platforms (both Cloud and HPC) are most effective when they are able to leverage well-curated data

collections and repository services. Hence, Tier 1 HPC facilities and the 'Cloud' computing capability should provide a mechanism for acquiring and sustainably funding the curation of large data collections and shared repositories on behalf of the sector within these platforms to meet the sector's publication, data and non-traditional (creative) works repository needs.

d. **Data visualisation**, while discussed under a few sub-headings, should now be considered as a broader enabling capability and could be developed as a new specific priority area under the eResearch platforms umbrella.

(ix) We strongly agree with a **staged implementation** approach. However, this needs to be adapted to suit the differing needs of existing highly functioning capabilities, those capabilities needing major changes in direction and entirely new capabilities.

We particularly support the need for a whole of government investment plan, given the major challenges to be addressed. It is essential that investment through the Research Infrastructure Roadmap aligns with investment through the MRFF and the BTF, as well as the National Innovation and Science Agenda.

(x) **Periodic review and realignment, including international benchmarking,** is also important. But this needs to occur within a funding environment that provides medium-term funding certainty for major capabilities, to enable retention of skills and expertise and career pathways for research support specialists.

(xi) The process for **Project Review** is only briefly outlined in the Draft Roadmap. This section should be expanded in the final document with a more concrete process around timing of reviews and outcomes.