

NATIONAL RESEARCH INFRASTRUCTURE CAPABILITY

Research Australia submission in response to the Issues Paper

September 2016

ABOUT RESEARCH AUSTRALIA

Research Australia is an alliance of 160 members and supporters advocating for health and medical research in Australia. Research Australia's activities are funded by its members, donors and supporters from leading research organisations, academic institutions, philanthropy, community special interest groups, peak industry bodies, biotechnology and pharmaceutical companies, small businesses and corporate Australia. It reflects the views of its diverse membership and represents the interests of the broader community.

Research Australia's mission is to make health and medical research a higher priority for the nation. We have four goals that support this mission:

- A society that is well informed and values the benefits of health and medical research.
- Greater investment in health and medical research from all sources.
- Ensure Australia captures the benefits of health and medical research.
- Promote Australia's global position in health and medical research.

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NATIONAL RESEARCH INFRASTRUCTURE CAPABILITY

RESEARCH AUSTRALIA SUBMISSION IN RESPONSE TO THE ISSUES PAPER

Introduction

Research Australia welcomes the commitment the opportunity to make this submission to the Expert Working Group in response to the Issues Paper. As requested, we have used the template provided for this purpose.

Submission Template

2016 National Research Infrastructure Roadmap Capability Issues Paper

Submission No: <i>(to be completed by Departmental staff)</i>	
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Would you like your submission to remain confidential, i.e. not published on the website?	No

Capability Areas

Question 1: Are there other capability areas that should be considered?

The Issues Paper has appropriately identified the capability areas that need to be considered.

Question 2: Are these governance characteristics appropriate and are there other factors that should be considered for optimal governance for national research infrastructure.

The listed governance characteristics are appropriate. We also need specific governance frameworks to address security issues where the infrastructure e.g. a data warehouse/computing facility- holds sensitive or protected information such as health information and national security information.

Question 3: Should national research infrastructure investment assist with access to international facilities?

The ability to access international infrastructure should be a part of any opportunity cost and risk weighted decision to acquire or develop any new national infrastructure. This should include the whole of life and other associated costs as part of this consideration.

The feasibility of obtaining adequate access to existing or planned international research infrastructure as an alternative to building or acquiring new Australian research infrastructure must also be weighed up against the national need and priorities of the broader research agenda.

Arrangements for international access by Australia to international infrastructure and vice versa could include a negotiated commercial fee for use basis, a contribution to costs or reciprocal access to other research infrastructure. The contribution by a consortium of New Zealand Government, universities and research institutes to the ongoing operation of the Australian Synchrotron is one current example.

This approach of encouraging international access to Australian research infrastructure can assist with determining the optimal scale, utilisation and efficiency of facilities, however potential international demand for domestic access needs to be realistic, and due consideration given to geography and national approach to enable foreign nationals to use the facilities for extended periods of time.

Question 4: What are the conditions or scenarios where access to international facilities should be prioritised over developing national facilities?

Key considerations are whether:

- there is sufficient demand from Australian researchers to fully utilise an Australian facility;
- there is sufficient 'spare' capacity at international facilities now and in the future to meet current and likely future Australian needs for access;
- access by Australian researchers can be guaranteed sufficient priority;
- the IP of Australian researchers will be sufficiently protected;
- access to international facilities is available now, compared to any delay that would be experienced in developing an Australian facility/capacity;
- the relative cost of 'purchasing' access compared to building Australian infrastructure, including the capacity to trade access to other Australian infrastructure and the scope for an Australian facility to offer capacity to international researchers;
- the commercial and scientific value of the technical and scientific expertise and insights that accrue from developing and operating a facility as opposed to buying access;
- the additional costs associated with international access, including the costs associated with international travel; and
- access to international facilities could enhance international collaboration by Australian researchers.

Question 5: Should research workforce skills be considered a research infrastructure issue?

There are some areas of research workforce skills that are closely related to research infrastructure and should be considered in tandem. For example, increasing Australia's computing capability is widely recognised as important but doing so will not, in itself, ensure that researchers are able to make the most effective use of any new facility. Australia needs to simultaneously address the current shortage of individuals with the necessary skills to create, manipulate, link and analyse datasets.

More generally, greater data capability is required not just where the research infrastructure is located but where the data is held and among the broader research community. Policy makers and health providers also need a greater access to and appreciation of the role that data can play in understanding the issues and developing solutions. As areas of expertise in the collection, manipulation and analysis of data, key research infrastructure facilities have a key role to play in informing and educating these groups.

The Australian Synchrotron provides a different example of the need to consider infrastructure and skills together. The Synchrotron has a team of technical and scientific staff who support the operation of the facility and assist researchers with the design and preparation of experiments and the capture and analysis of data. These staff have built important capabilities and expertise over time which enhance the effectiveness and efficiency of the Synchrotron and of the experiments conducted there and play a critical role in knowledge transfer and skills development for the external research community they engage with.

Question 6: How can national research infrastructure assist in training and skills development?

As addressed in the previous answer, in many cases the staff of national research infrastructure facilities play a critical role in the training and skills development of their client research communities, and educating the broader community.

The cost of training staff employed by research infrastructure facilities and the training and development required to be provided by the facilities to external users should be explicitly recognised as part of the ongoing operating costs of national research infrastructure.

These ongoing operating costs must be considered and assessed as part of the whole of life cycle feasibility of any future capital investment in national research infrastructure.

Question 7: What responsibility should research institutions have in supporting the development of infrastructure ready researchers and technical specialists?

Where the responsibility lies depends on the nature of the infrastructure and the skills required, and is likely to be a continuum. Where the skills are very specific to the infrastructure, it will likely be most appropriate for the infrastructure provider to employ the appropriate technical specialists and staff and to arrange the necessary specialist training. It will also be appropriate for the facility to provide the appropriate orientation and other site or equipment specific training to researchers utilising the facility.

Where the skills and knowledge are more general and/or provide a foundation for the site or facility specific knowledge there is clearly a role for higher education institutions to provide training and qualifications. There is scope for research infrastructure facilities to partner with higher education institutions in the quest for accreditation and qualifications related to the operation and utilisation of some research infrastructure.

Question 8: What principles should be applied for access to national research infrastructure, and are there situations when these should not apply?

Access to national research infrastructure should be open and competitive. While in all cases access should be based on merit, the specific criteria for selection (what constitutes merit) are likely to vary from one facility to another.

Where the facility is aligned with one or more of the National Science and Research Priorities and their associated Practical Research Challenges these should guide the selection criteria. Similarly, where the facility is aligned with one or more of the six industry sectors of competitive strength and strategic priority (Advanced Manufacturing; Cyber Security; Food and Agribusiness; Medical Technologies and Pharmaceuticals; Mining Equipment, Technology and Services; and Oil, Gas and Energy Resources) the relevant strategy for that industry sector should influence the criteria. The latter is likely, for example, to see a greater emphasis on potential commercialisation opportunities of the research as a selection criterion.

Question 9: What should the criteria and funding arrangements for defunding or decommissioning look like?

A commitment to funding needs to be made for the expected lifecycle of any research infrastructure, including maintenance, anticipated upgrades and decommissioning. These estimated costs and the timeframes need to be regularly reviewed and revised where necessary. Where funding has been provided by more than one agency or level of government, responsibility for funding across the whole lifecycle and decommissioning must be explicitly agreed between the parties at the outset. This ensures that a timely allowance for the funds required can be factored into national planning and/or accumulated over the lifecycle of the infrastructure rather than creating an unnecessary funding crisis at the end of life.

Question 10: What financing models should the Government consider to support investment in national research infrastructure?

Financing models should be fit for purpose, but in all cases the government needs to consider and model the economic and other returns that it is seeking to ensure that that whatever financial model is adopted is risk assessed and appropriate. This is particularly important in partnerships with the private sector or between governments. To the greatest extent possible, limits need to be placed on potential total expenditure and open ended commitments to funding should be avoided to protect the public purse.

As a matter of good practice, there should be absolute clarity about which activities are being funded and by whom, and the contribution that each party is making; no project should commence until all the necessary funding has been secured. This includes explicit recognition of both the direct and indirect costs and allocation of responsibility among the parties as part of the agreement.

Co-investment with international facilities and partners can also bring non financial and indirect benefits, such as promoting regional cooperation in Australia's broader national interests. Australia's investments with the Korean Atomic Energy Research Institute (KAERI) and the Japan Proton Accelerator Research Complex (J-Parc) facilities are examples.

The potential value of such indirect benefits needs to be carefully evaluated as part of the investment process however, and should not be used to justify an otherwise uncompetitive bid.

Question 11: When should capabilities be expected to address standard and accreditation requirements?

Beyond meeting standard and accreditation requirements required by Australian law or regulation, consideration needs to be given to the legitimate expectations and requirements of researchers and commercial partners. For example, accreditation to a particular international standard may be required for experimental results to be accepted by an overseas regulator. If an Australian research facility is competing with other facilities around the world that comply with a certain standard or hold a particular accreditation, the Australian facility will need to do likewise if it is to achieve or maintain the reputation needed to attract researchers.

Any proposal for the acquisition or development of new research infrastructure should explicitly identify the required and/or desired standards and accreditation the facility needs to meet and the cost of meeting and maintaining these standards and accreditation. Both the need for the standards and accreditation and the associated costs should be tested as part of the evaluation of the proposal.

Question 12: Are there international or global models that represent best practice for national research infrastructure that could be considered?

Research Australia has not responded to this question.

Question 13: In considering whole of life investment including decommissioning or defunding for national research infrastructure are there examples domestic or international that should be examined?

Research Australia has not responded to this question.

Question 14: Are there alternative financing options, including international models that the Government could consider to support investment in national research infrastructure?

Research Australia has not responded to this question.

Health and Medical Sciences

Question 15: Are the identified emerging directions and research infrastructure capabilities for Health and Medical Sciences right? Are there any missing or additional needed?

The Issues Paper appears to have appropriately identified the emerging directions and research infrastructure capabilities. The difficulty of course, when the timelines for the development and acquisition of research infrastructures are long, it is key to ensure that the infrastructure investment remains appropriate to Australia's future needs and scientific developments. This would include reviewing such investment proposals in the broader national interest and need context, rather than as isolated proposals.

Question 16: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Research Australia has not responded to this question.

Question 17: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Health and Medical Sciences capability area?

There is an emerging recognition of the urgent need for national research infrastructure that is able to support the linking and creation of health information on a larger scale and more routinely than is currently the case.

This infrastructure needs to be able to draw on multiple different sources of data from across Commonwealth, State and Territory jurisdictions. While there are certainly technical challenges to be overcome, other barriers include specific legislative provisions, a lack of skills in the creation, manipulation and analysis of large datasets, and some resistance within agencies that hold data to the sharing of data.

The creation of further research infrastructure in this area needs to be part of a broader strategy to overcome legal, workforce and resourcing issues related to the individual data sources and the broad spectrum of agencies with responsibility for them. This includes careful consideration of governance arrangements to ensure national cross-jurisdictional participation can be achieved and encouraged. The Productivity Commission has been tasked with an Inquiry into how to improve the availability and use of Commonwealth Government data and is considering some of these issues.

Environment and Natural Resource Management

Research Australia has not responded to the questions in relation to Environment and Natural Resource Management.

Advanced Physics, Chemistry, Mathematics and Materials

Research Australia has not responded to the questions in relation to Advanced Physics, Chemistry, Mathematics and Materials.

Understanding Cultures and Communities

Research Australia has not responded to the questions in relation to Understanding Cultures and Communities

National Security

Research Australia has not responded to the questions in relation to National Security.

Underpinning Research Infrastructure

Question 30: Are the identified emerging directions and research infrastructure capabilities for Underpinning Research Infrastructure right? Are there any missing or additional needed?

The Issues Paper has appropriately identified the emerging directions and research infrastructure capabilities for Underpinning Research Infrastructure.

Question 31: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Research Australia has not responded to this question.

Question 32: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Underpinning Research Infrastructure capability area?

Research Australia has not responded to this question.

Data for Research and Discoverability

Question 33 Are the identified emerging directions and research infrastructure capabilities for Data for Research and Discoverability right? Are there any missing or additional needed?

The Issues Paper has appropriately identified the emerging directions and research infrastructure capabilities for Data for Research and Discoverability.

Question 34: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Research Australia has not responded to this question.

Question 35: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Data for Research and Discoverability capability area?

Research Australia has not responded to this question.

Other comments

Research Australia has provided its comments in the body of the submission with thanks.

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