

## Submission

### 2016 National Research Infrastructure Roadmap Capability Issues Paper

<b>Name</b>	<b>John Carlin</b>
<b>Title/role</b>	<b>Professor of Biostatistics</b>
<b>Organisation</b>	<b>Murdoch Childrens Research Institute &amp; The University of Melbourne</b>

Question 1: Are there other capability areas that should 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.

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

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

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

Yes, I believe this is critical. In particular, Australia is falling badly behind the rest of the world in the statistical sciences. It is notable that the word “statistics” does not appear once in the issues paper. The use of more contemporary terms such as bioinformatics is to an extent masking the importance of the discipline of statistics, which has a core role in modern analytics but is struggling to stay viable within Australian universities. The problem is to some extent circular, with insufficient engagement of the academic discipline with modern data challenges (partially due to inadequate capacity) leading to stagnation of programs and difficulty attracting students.

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

By funding training programs, e.g. investment in building and maintaining core disciplines such as statistics. These programs need kick-start funding in order to ensure that training keeps up with the pace of technological development and the capacity of technology to produce new forms of data. However, they also need solid academic foundations, so the emphasis should be on full programs rather than short courses.

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

They must bear ultimate responsibility, of course.

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

- Question 9: What should the criteria and funding arrangements for defunding or decommissioning look like?
- Question 10: What financing models should the Government consider to support investment in national research infrastructure?
- Question 11: When should capabilities be expected to address standard and accreditation requirements?
- Question 12: Are there international or global models that represent best practice for national research infrastructure that could be considered?
- 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?
- Question 14: Are there alternative financing options, including international models that the Government could consider to support investment in national research infrastructure?

#### **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?

I believe the emphasis on Big Data and analytics is appropriate, but there may be inadequate recognition of the need for serious data science (statistics, bioinformatics) to underpin these developments. The required capacity is not just technical, it is intellectual. We seem continually to allow the production of data to run ahead of the scientific expertise that is needed to make full use of it.

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

#### **Environment and Natural Resource Management**

- Question 18: Are the identified emerging directions and research infrastructure capabilities for Environment and Natural Resource Management right? Are there any missing or additional needed?
- Question 19: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?
- Question 20: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Environment and Natural Resource Management capability area?

#### **Advanced Physics, Chemistry, Mathematics and Materials**

Question 21: Are the identified emerging directions and research infrastructure capabilities for Advanced Physics, Chemistry, Mathematics and Materials right? Are there any missing or additional needed?

Question 22: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 23: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Advanced Physics, Chemistry, Mathematics and Materials capability area?

#### **Understanding Cultures and Communities**

Question 24: Are the identified emerging directions and research infrastructure capabilities for Understanding Cultures and Communities right? Are there any missing or additional needed?

Question 25: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 26: Is there anything else that needs to be included or considered in the 2016 Roadmap for the Understanding Cultures and Communities capability area?

#### **National Security**

Question 27: Are the identified emerging directions and research infrastructure capabilities for National Security right? Are there any missing or additional needed?

Question 28: Are there any international research infrastructure collaborations or emerging projects that Australia should engage in over the next ten years and beyond?

Question 29: Is there anything else that needs to be included or considered in the 2016 Roadmap for the National Security capability area?

#### **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?

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

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

#### **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?

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

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?

**Other comments**

If you believe that there are issues not addressed in this Issues Paper or the associated questions, please provide your comments under this heading noting the overall 20 page limit of submissions.

Submissions using this template should be sent to  
[RoadmapSubmissions@education.gov.au](mailto:RoadmapSubmissions@education.gov.au) .

The submissions process will close on Friday 9 September 2016.