Please note: the substantive content of the 2026 NRI Roadmap Survey begins at Question 20 (with prior questions dealing with administrative and other information).

As such all submissions that are published include the responses submitted from Question 20 onwards only.

Q20.

Part 2: Research themes

2.1 NRI comprises the assets, facilities and associated expertise to support leading-edge research and innovation in Australia and is accessible to publicly and privately funded users across Australia and internationally. We are seeking your input on possible directions for future national-level investment - i.e., where the requirements are of such scale and importance that national-level collaboration and coordination are essential.

The 2021 Roadmap used a challenge framework to support NRI planning and investment. With this in mind, consider likely future research trends in the next 5 - 10 years, and with respect to one or more of the 8 challenge areas identified in the 2021 Roadmap as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or not at sufficient scale and
- describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities.

Q21.

Resources Technology and Critical Minerals Processing

Q22.

Food and Beverage

Q23.
Medical Products

• Drug screening using high-throughput 3D and other organoid cell-based models. • Drug Development: Magnetic Resonance, X-Ray Diffraction • Medical device development: Vibrational spectroscopy • Micro-electron diffraction

Q24.
Defence

Q25.
Recycling and Clean Energy

• High-throughput materials discovery: automated synthesis linked to X-ray diffraction, X-ray spectroscopy, electron diffraction, solid state NMR • Physical properties characterisation: high-field magnetometry, extreme environment TGA/DSC, spectroscopy for electronic/optoelectronic properties

Q26.
Space

Q27.
Environment and Climate

• Detecting extremely small amounts of pollutants: Vibrational spectroscopy, X-Ray Fluorescence

Q28.
Frontier Technologies and Modern Manufacturing

• High-throughput materials discovery: automated synthesis linked to X-ray diffraction, X-ray spectroscopy, electron diffraction, solid-state NMR • Physical properties characterisation: high-field magnetometry, extreme environment TGA/DSC, spectroscopy for electronic/optoelectronic properties • Non-destructive analysis: CT and phase-contrast X-ray imaging

Q29.

2.2 The 2024 statement of National Science and Research Priorities (NSRPs) includes outcomes linked to each priority to assist in identifying critical research needed in the next 5 to 10 years.
Consider the priority statements and, with respect to one or more of the 5 priority areas as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or
- not at sufficient scale and describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities, and where relevant, refer to the underpinning outcomes and research identified in the NSRPs document.

Q30.

Transitioning to a net zero future

• High-throughput materials discovery: automated synthesis linked to X-ray diffraction, X-ray spectroscopy, electron diffraction, solid-state NMR • Physical properties characterisation: high-field magnetometry, extreme environment TGA/DSC, spectroscopy for electronic/optoelectronic properties

Q31.

Supporting healthy and thriving communities

• New treatments and medicines to help the healthcare system support the ageing population: magnetic resonance, drug discovery, high throughput screening utilising disease-relevant organoids • Improved screening and diagnostic technologies: drug discovery, magnetic resonance, vibrational spectroscopy

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia’s environment

• Detecting extremely small amounts of pollutants: Vibrational Spectroscopy, X-Ray Fluorescence

Q34.

Building a secure and resilient nation

• Technologies for managing and monitoring the environment and water quality: Vibrational spectroscopy, magnetic resonance

Q35.

2.3 The case for a new NRI capability, or enhancements to existing capabilities, typically emerges through advocacy from research communities clustering around rigorously identified needs and goals. Such a concept could respond to a requirement for novel or expanded capacity within a domain, or across domains, and must be such that it could only be made available with national-level investment.

If you have identified such a requirement, briefly describe the need, the proposed infrastructure capability, the medium-term goals, impacted research communities, and the timeframe over which you advocate its establishment. Your response can include links to relevant existing reports.

Along with countless others across the country, I strongly support a new NCRIS for Magnetic Resonance (MR) in Australia. MR is an indispensable capability and a cornerstone of molecular/biomolecular/chemical/materials analysis with applications across quantum computing, chemical synthesis, environmental monitoring, natural product discovery, drug discovery and development, forensic and health studies, to name just a few. It is widely accepted that Australia's fragmented MR infrastucture currently lags far behind the US, Europe, and most of Asia. There is an urgent need for widespread maintenance and infrastructure upgrades. An NCRIS capability is the perfect medium through which this can be achieved, from economic, scientific, industrial, and commercial perspectives. Coordination of a national MR network and capability through NCRIS will enable to maintain, upgrade, and leverage existing MR infrastructure, provide access to researchers across the country, maximise return on investment, safeguard capability, and ensure that Australia’s research community can continue to produce world-leading scientific and/or industrial outcomes.

Q36.

Part 3: Industry perspectives

This section is seeking input specifically from industry-based respondents. Other respondents can skip this section.

Recommendation 6 of the 2021 Roadmap related to improvements in industry engagement with NRI. To complement work on this topic that has occurred since then, we are seeking additional advice on NRI requirements as perceived by current or potential industry-based users.

Q37.

3.1 Have you (or your organisation) interreacted with or used Australia's NRI?

- (●) Yes
- ( ) No

Q38.

3.2 If so, please briefly outline the NRI capabilities you (or your organisation) have interacted with or used. Do not limit your response to NCRIS capabilities.

Q39.

3.3 Please indicate your (one or more) primary reasons for interacting with NRI:

- [ ] For expertise or advice
- [ ] Access to research resources or products
- [x] Access to equipment for research
- [ ] Access to equipment for operational reasons
- [ ] Help in translating research
- [ ] Access to data
- [ ] Support for clinical trials
- [ ] Other (please specify) _____

Q40.
3.4 If you answered no, please indicate your (one or more) primary reasons:

This question was not displayed to the respondent.

Q41.
Part 4: Other comments
4.1 Please elaborate on any of your above responses or add any other comments relevant to the development of the 2026 Roadmap. Your response can include reference or links to existing reports that you recommend be considered during the 2026 Roadmap development process.