Australian Government

THE NATIONAL SECURITY SCIENCE AND INNOVATION STRATEGY

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Preface

The Hon Anthony Byrne MP
Parliamentary Secretary to the Prime Minister

The Australian Government is committed to preparing the nation for future challenges. It is listening to advice from across the community and taking action to ensure we are positioned strongly for the next decade.

Science and innovation is an investment in our future prosperity. The power and potential of science and innovation to build a better Australia, and contribute to a better world, has driven the Australian Government's innovation agenda, set out in *Powering Ideas, An Innovation Agenda for the 21st Century*.

The importance of science and innovation to our national security is well-established. The Defence Science and Technology Organisation has a proud history of applying science and technology to protect the nation and, more recently, Australian Government research agencies have come together to enhance our counter-terrorism capabilities. Our universities and private sector continue to make invaluable contributions to our national security and we are strengthened by collaborative partnerships across all sectors.

As the Prime Minister laid out in the inaugural National Security Statement, challenges to our security are increasing. Recent events have shown that terrorism remains an enduring threat. We continue to require robust defence capabilities, secure borders and good relations with our region and the world. However, climate and demographic change, resource and cyber security, and the impact of extreme economic events may shape the national security environment.

This Strategy establishes how we can apply science and innovation to the national security requirements of today and the challenges of tomorrow. It sets out where we need to develop our science and innovation capabilities and undertake work. These are tasks that require support from across the community and the Strategy also establishes new methods to facilitate collaborative and coordinated work.

I am pleased that this Strategy has been developed in a consultative manner, drawing on contributions from across the Commonwealth, state and territory governments, universities, industry and our international partners. The Strategy establishes a clear pathway for how we can all work together to deliver science and innovation which enhances our national security.

I look forward to the conversations and partnerships this Strategy will initiate and the outcomes these connections will produce.

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1 Our approach to national security science and innovation

1 Our approach to national security science and innovation

In the inaugural National Security Statement to Parliament in December 2008, the Prime Minister declared that "Australia must remain technologically and scientifically alert, agile and robust so as to anticipate and respond to new and emerging threats".

The aim of the National Security Science and Innovation Strategy is to enhance the application of science and innovation to our national security.

1.1. The basis for the Strategy

Science and innovation is vital for the nation's security. It makes us more effective in our preparation, smarter in our preventative measures, stronger in our response and more rapid in our recovery. Australia has a proud track record of producing world-leading science and innovation for these purposes. Dedicated individuals and communities currently work together in numerous ways to produce science and innovation outcomes which make us more resilient and secure. In doing so, they draw on the infrastructure and resources available through our government agencies, universities, companies and our international partnerships.

However, national security is growing increasingly complex. Defending the nation, engaging with our region, countering terrorism and protecting our borders remain enduring and critical tasks. Yet we must be ready for challenges presented by broader environmental, social and economic changes or catastrophic events.

National security is also increasingly affected by technological change in the broader community. Breakthroughs or advances from other sectors or fields of research can be applied to improve the efficiency and effectiveness of national security capabilities. New technologies transform how we communicate, travel, store valuable information and manage our finances. Terrorists or criminals can create or target vulnerabilities by exploiting ubiquitous or emerging technologies.

We will ensure our science and innovation efforts are able to meet these new national security challenges through this Strategy, which will establish:

- A new policy framework for national security science and innovation that aligns the national security and the science and innovation policy environments;
- A coordinated process for prioritising national security science and innovation activities, resources and the development of capabilities, building on our strong base of dedicated expertise;
- A balanced approach to delivering national security science and innovation outcomes that meets immediate requirements while building the capacity to meet longer-term challenges;
- An enhanced method for providing the science and innovation community with visibility of the growing range of national security community requirements to encourage relevant work; and
- A comprehensive plan to improve collaboration across the public, academic and private sectors and with our international partners.

Significant and evolving challenges lie ahead. Strong national security capabilities to meet these challenges involve and benefit all of us. The continuing smart application of science and innovation to these capabilities is crucial to ensuring they remain effective.

1.2. The context for the Strategy

As set out in the National Security Statement, we face an increasing range of threats and challenges to our national security (see Figure 1). In response, the national security community continues to expand beyond its traditional and enduring base of defence, diplomacy and intelligence.

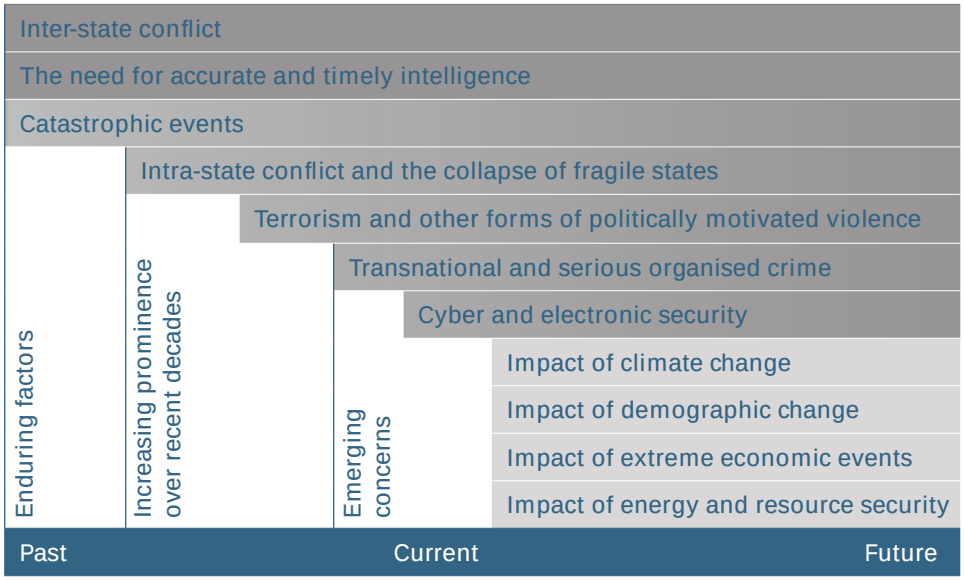


Figure 1: The spectrum of national security challenges

The Government, through the commissioning of the Homeland and Border Security Review, the delivery of the National Security Statement and the appointment of a National Security Adviser, has committed to improving coordination and strategic direction across this expanded community.

Developing a comprehensive and consistent approach to science and innovation support to national security is an important component of improving coordination and strategic direction. It was identified as a priority within the Homeland and Border Security Review and the National Security Statement. Complementary national security policy initiatives include the Counter Terrorism White Paper, the Serious and Organised Crime Strategic Framework and the Strategic Border Management Plan. This Strategy has been developed in parallel with these initiatives to ensure a consistent approach to the application of science and innovation across all sectors.

The Defence White Paper, *Defending Australia in the Asia Pacific Century: Force 2030*, is another key component of national security policy. It focuses on the future capabilities of the Australian Defence Organisation and covers science and innovation support to these capabilities, including the role of the Defence Science and Technology Organisation (DSTO). Consequently, while cognisant of the Defence White Paper, this Strategy focuses on non-defence national security. The Defence White Paper notes that DSTO's capabilities will remain available to support the Government's broader national security requirements.

The Australian Government provides significant support to science and innovation, investing $8.6 billion in this area in 2009–10. The Australian Government has also set out a new direction for the national innovation system in its innovation policy, *Powering Ideas, An Innovation Agenda for the 21st Century*. This provides a framework that will assist the national security community engage more strongly with the broader science and innovation community.

1.3. National security objectives for science and innovation

The Australian Government has identified twelve objectives for science and innovation to enhance our national security (see Table 1). Chapter 2 sets out how science and innovation can be applied to each of these objectives in greater detail.

A more prepared and resilient society	
A. Cyber protection and electronic security	Enhancing the resilience of our information and communication systems against attack or damage.
B. Physical resilience	Enhancing the ability of our physical infrastructure to withstand attack or damage and remain functional.
C. Social resilience	Developing new approaches to enhance social cohesion, community and organisational preparedness, and risk awareness.
D. Areas of emerging national security concern	Preparing Australia for emerging challenges through understanding their potential impact and possible responses.
E. Forecasting, modelling and risk assessment	Developing better approaches to inform decision making on the impact of threats and the effectiveness of our responses.
F. First responder capabilities	Ensuring our agencies possess the necessary knowledge and equipment to assist and protect the community.
Smarter use of information	
G. Information management and sharing	Providing new tools and methods for the national security community to share and use information
H. Command and control	Enhancing how the national security community makes decisions, shares operational information and communicates in a crisis.
I. Policies and standards	Contributing to the evidence base for policies and standards that enhance our national security.
J. Intelligence collection and analysis	Improving the ability of agencies to capture, integrate and analyse information from multiple sources.
K. Surveillance, detection and identification	Developing smarter tools and methods to detect, observe, monitor and identify entities of interest or concern.
L. Forensic and investigation capabilities	Ensuring agencies have the ability to collect, analyse and use evidence from a range of sources.

Table 1. National security science and innovation objectives

1.4. Policy elements of the Strategy

Achieving these objectives will be supported through a policy framework which:

- Recognises the importance of science and innovation in protecting our national security;
- Integrates science and innovation into broader national security policy coordination efforts;
- Incorporates the breadth and importance of national security requirements in science and innovation policy and funding programs; and
- Develops specific mechanisms to bring together Australian Government national security science and innovation agencies.

1.5. Achieving our aim

The Australian Government will implement the following practical steps to achieve our aim of enhancing the application of science and innovation to Australia's national security.

For further information:

Identify and resource relevant science and innovation capabilities by:

Chapter 3

- Undertaking detailed analysis to establish where relevant science and innovation capabilities exist across the Australian Government, universities and the private sector;
- Facilitating the development of new capabilities through prioritised funding processes, particularly where we require greater support to achieve our identified objectives; and
- Establishing a Register to recognise the critical importance of particular items of science and innovation infrastructure in protecting our national security and to maintain and enhance their work.

Prioritise and resource science and innovation activities by:

Chapter 4

- Bringing together the science and innovation priorities of the whole national security community and publish them publicly in a consolidated annual statement;
- Working with science and innovation funding programs to enhance support to relevant activities, including through the provision of expert advice as required; and
- Encouraging the science and innovation community, when working on relevant activities, to draw on the full range of support available through the Australian Government and international partners.

Transition science and innovation into national security capabilities by:

Chapter 5

- Working more closely with the private sector to enhance the adaptation and commercialisation of science and innovation outcomes for national security purposes;
- Encouraging the national security community to take greater responsibility for integrating science and innovation activities into broader capability development processes; and
- Working with the science and innovation and the national security communities to ensure research outcomes are shared as widely as possible.

Work more effectively with the national security community by:

Chapter 6

- Making science and innovation an integral part of the national security prioritisation and Budget processes, and the work of our national security committees;
- Enhancing the coordination and promotion of science and innovation within the national security community, including through the work of the National Security Adviser; and
- Establishing closer and more effective relationships with our international partners on national security science and innovation.

Work more effectively with the science and innovation community by:

Chapter 7

- Developing priorities, policies and processes in a manner that reflects, complements and enhances the National Research and Innovation Priorities;
- Ensuring the integration of national security science and innovation into the reforms set out in *Powering Ideas, An Innovation Agenda for the 21st Century*; and
- Ensuring national security is appropriately reflected in the work and membership of science and innovation coordination bodies.

Bring the science and innovation and the national security communities together by:

Chapter 8

- Establishing the National Security Science and Innovation Advisory Board and Steering Committee to improve communication, collaboration and coordination between the two communities;
- Bringing experts together to work collaboratively on challenges through working groups, advisory panels and workshops; and
- Improving communications, including through the National Security Science and Innovation Directory, an annual National Security Innovation Conference and Exhibition and a new online portal.

EXIT

2 National security objectives for science and innovation

2 National security objectives for science and innovation

The Australian Government has identified twelve objectives for national security science and innovation. The realisation of these objectives will help us build a more prepared and resilient society and allow the national security community to make smarter use of information. In combination, they will enhance the full spectrum of our national security capabilities.

A brief description of each objective is provided below. Numbers and letters are used to provide clarity in ordering but do not represent any form of prioritisation.

2.1. A more prepared and resilient society

We can reduce the risk posed by national security threats through improving the resilience of our community, organisations, electronic systems, and physical infrastructure. Taking a comprehensive approach to these inter-connected challenges, equipping our first responders, and gaining a better understanding of these threats and our response to them are important parts of this work.

Objective A	Cyber protection and electronic security
Context:	Australians increasingly rely on the secure and continuous operation of electronic networks for communications, for online activities and for many other aspects of our daily lives. Our utilities, businesses and government agencies have a critical dependency on information systems. This demands a constant investment in science and innovation to ensure we remain alert and responsive to evolving threats.
Objective for science and innovation:	To enhance the resilience of our information and communication systems against attack or damage
Key tasks for achieving the objective:	A1. Developing self-deploying, monitoring and protection systems for the mitigation of illegitimate cyber activity; A2. Developing new concepts for user authentication, and for limiting the consequences of attack, including insider attack; A3. Developing new methods to secure voice and data communications; A4. Ensuring the resilience and continuity of next generation networks; and A5. Ensuring the integrity of critical data and the rapid recovery of critical systems.

Objective B	Physical Resilience
Context:	Buildings and infrastructure need to be able to withstand the consequences of physical attack or damage whilst minimising the visual impact of protective measures, particularly in our city environments. Beyond individual buildings, the design of critical infrastructure must be resilient to intentional, natural or accidental damage. Layers of security and protection also need to be developed and applied in an integrated fashion. Significant expertise within engineering disciplines can be applied in this area.
Objective for science and innovation:	To enhance the ability of our physical infrastructure to withstand attack or damage and remain functional.
Key tasks for achieving the objective:	B1. Innovative design and use of physical materials to enhance protection; B2. Improving methods for controlling physical access; and B3. Improving the design of facilities or infrastructure to be less vulnerable to the impact of failure to any one node or component.

Objective C	Social Resilience
Context:	We can only be secure and strong as a nation by being robust and resilient as a society and economy. Empowered and inclusive communities and organisations are better able to deal with the stresses caused by broader socio-economic factors and the shocks delivered if a national security incident occurs. This not only requires strong and adaptive social and organisational structures but also individuals and groups who are aware of national security risks and able to make informed decisions and choices before, during and after incidents.
Objective for science and innovation:	To develop new approaches to enhance social cohesion, community and organisational preparedness, and risk awareness.
Key tasks for achieving the objective:	C1. Developing the evidence-base for strategies to build community, organisational and social resilience and strengthen recovery mechanisms; C2. Understanding the root causes, key drivers and triggers for social and community fragmentation, disharmony or dislocation; and C3. Understanding individual and group susceptibilities to political, ideological and economic forces and their implications with regard to anti-social and illegal behaviours.

Objective D	Areas of emerging national security concern
Context:	The National Security Statement highlighted the growing range and complexity of factors that can impact on our national security. These factors will have direct and indirect consequences that may create new vulnerabilities or require new responses from the national security community.
Objective for science and innovation:	To prepare Australia for emerging challenges through understanding their potential impact and possible responses.
Key tasks for achieving the objective:	While horizon scanning, forecasting or modelling may identify other areas, three factors have already been identified as requiring further analysis: D1. Understanding of and preparation for the national security implications of climate change; D2. Appreciating the national security consequences that may arise due to increased pressures on our region's food, water and energy resources; and D3. Understanding and responding to the impact of transnational and serious and organised crime on our national security, including links with terrorism financing and people, drugs or weapons smuggling.

Objective E	Forecasting, modelling and risk assessment
Context:	It is important that we understand the likelihood and consequences of the threats we face, the effectiveness of our capabilities and the resilience of our community and infrastructure. Forecasting and modelling tools and techniques can provide this information and ensure decision makers understand the impact of their decisions across a range of scenarios. This allows risk-informed decisions, effective resource allocation, and planned responses.
Objective for science and innovation:	To develop better approaches to inform decision making on the impact of threats and the effectiveness of our responses.
Key tasks for achieving the objective:	E1. Representing and analysing threat events, effects, and treatment options accurately; E2. Assessing the range and impacts of natural and man-made hazards, including climate change or viral propagation, and their potential to translate into national security issues; E3. Understanding complex national systems that sustain our society and economy, and developing the means to test and assess the implications of business decisions or major societal trends; and E4. Enhancing risk communication, assessment and management tools and techniques for both strategic and operational contexts.

Objective F	First responder capabilities
Context:	It is critical that our first responders are able to assist the community prevent, prepare for, respond to, and recover from national security incidents. This includes in interventions to prevent or respond to suspicious or illegal activities, dealing with consequences of harmful events and helping recovery processes.
Objective for science and innovation:	To ensure our front-line agencies possess the necessary knowledge and equipment to assist and protect the community
Key tasks for achieving the objective:	F1. Developing new technologies and methods for rapid triage, appraisal of damage, and evidence assessment for first responders; F2. Developing non-lethal compliance systems for individuals and groups at varying standoff distances; F3. Enhancing protective equipment used by law enforcement officers; and F4. Enhancing chemical, biological, radiological, nuclear and explosives 'render-safe' devices or decontamination equipment.

2.2. Smarter use of information

We need to be able to share information critical to national security seamlessly between stakeholders in a timely and usable manner and use it to make better and more informed decisions. The exponential increase of data being generated and shared makes the management and use of information more complex. The rapid evolution of information technology presents many new opportunities to enhance how we gather, analyse, share and present information.

Objective G	Information management and sharing
Context:	Our national security is reliant on individuals, agencies and levels of government working together in a coordinated and effective manner. This can only be achieved through the appropriate sharing of relevant information in a timely and secure manner, both during times of crisis and as part of normal operations. The role of a National Security Chief Information Officer, working to the National Security Adviser is central to enhancing coordination in this area.
Objective for science and innovation:	To provide new tools and methods for the national security community to share and use information
Key tasks for achieving the objective:	G1. Developing new security paradigms and protocols to support appropriate access to information between broad sets of decision-makers at varying security levels; G2. Enhancing the technical capability to share information, providing access to interoperable, timely, mobile and fit-for-purpose information across relevant government agencies and business; and G3. Developing new concepts and technologies to assist government agencies manage knowledge both within and across their boundaries.

How science and innovation enhances national security:

Critical Infrastructure Protection Modelling and Analysis (CIPMA)

The Australian Government has developed a capability to model the complex inter-dependencies between critical infrastructure systems, and how a failure in one sector can greatly affect the operations of other sectors. Sectors include banking and finance, communications, and energy, with the incorporation of water and transport sectors under development.

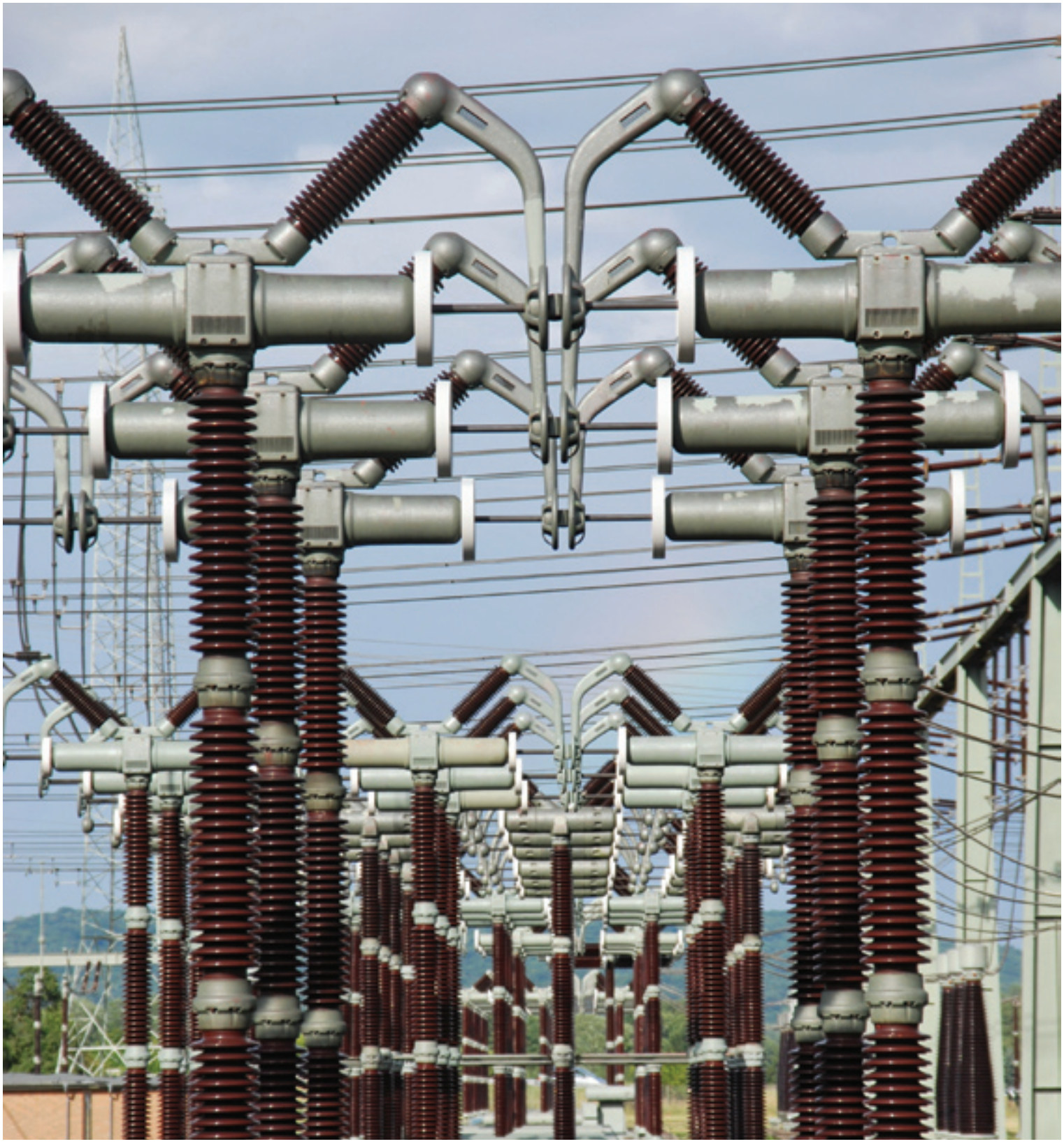
Objective H	Command and control
Context:	National security crises present difficult decisions for individuals at all levels of the community, from first responders and operators through to the leaders of our agencies and our governments. The decision-maker requires a clear, comprehensible, accurate and timely picture. The decision must then be able to be communicated in a secure and timely manner. Communication systems must be interoperable and reliable in challenging environmental conditions.
Objective for science and innovation:	To enhance how the national security community makes decisions, shares operational information and communicates in a crisis.
Key tasks for achieving the objective:	H1. Developing secure, hardened, mobile, interoperable communications; H2. Producing capabilities for sharing operational pictures that match the needs of human cognition; H3. Developing decision support systems that integrate with internal or distributed models, and fuse diverse forms and sources of information; H4. Developing methods to alert and support the public, business and government with tailored and timely information through all phases of incidents; and H5. Providing training and experimentation support that exercises and enhances decision-making and response capabilities.

Objective I	Policies and standards
Context:	Our approach to national security must be guided by evidence-based policies that maximise our effectiveness and defined by technical standards for consistent and accountable performance. Science and innovation can contribute to this evidence base through analysis of existing policies and processes or the development of new models of operation.
Objective for science and innovation:	To contribute to the evidence base for national security policies and standards.
Key tasks for achieving the objective:	I1. Contributing to the evidence base underlying the design of policies to enhance Australia's national security capabilities and the resilience of our society; I2. Analysing new national security structural arrangements, policy and legislation; and I3. Developing national and international standards, and best practice methods.

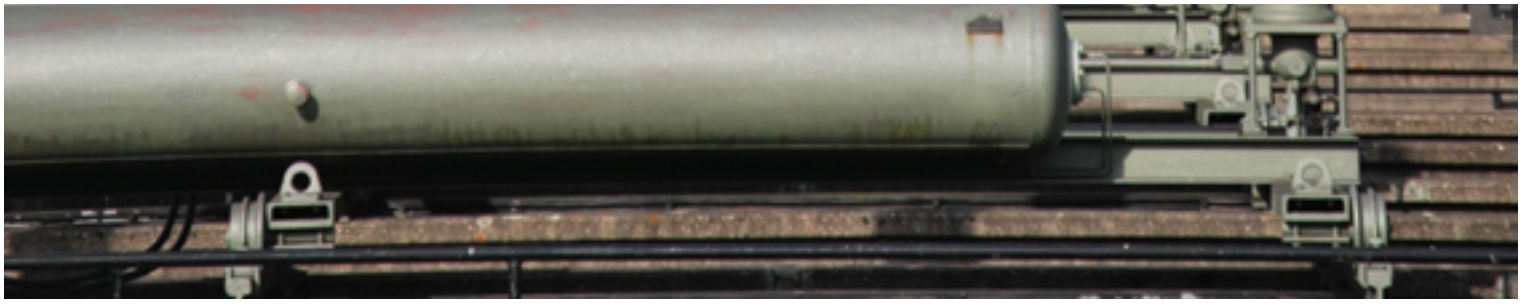
Objective J	Intelligence collection and analysis
Context:	Timely and accurate intelligence is critical for national security, not only for intelligence and law enforcement agencies but also financial institutions, border security agencies and health authorities. The efficient collection, analysis and dissemination of information relies on a successful combination of human and technical systems. Rapidly changing and advancing technologies can transform the efficacy of how this information is collected, integrated and applied.
Objective for science and innovation:	To improve the ability of agencies to capture, integrate and analyse information from multiple sources.
Key tasks for achieving the objective:	J1. Developing capabilities to exploit new sources of information; J2. Developing new and enhanced techniques for the collection of information from existing sources, including the opportunities and challenges posed by new and emerging technologies; J3. Developing novel techniques for assessing and analysing data of rapidly increasing volume and variety; and J4. Developing capabilities to analyse and visualise complex information from diverse sources

Objective K	Surveillance, detection and identification
Context:	Technology can be used to track and identify objects or people and monitor or screen for hazardous materials or threats. This can involve the observation and assessment of explosives, chemical, biological or radiological agents, disease, drugs and other contraband. In tracking people and objects, tools can detect and trace movement and authenticate identity.
Objective for science and innovation:	To develop smarter tools and methods to detect, observe, monitor and identify entities of interest or concern.
Key tasks for achieving the objective:	K1. Developing the capability and capacity to conduct wide area surveillance for border security; K2. Improving the use of remote sensing tools to monitor environmental events and the impact of climate change; K3. Enhancing capability to detect, track and identify people or objects (containers, commodities or vehicles) leveraging national and international systems; K4. Developing new approaches to the recognition and analysis of anomalous behaviours of individuals and groups; K5. Developing early warning systems for the detection, identification and monitoring of chemical, biological, radiological and other health hazards; and K6. Enhancing screening capabilities, including through automated sensors, for the rapid, standoff detection of explosives, people, diseases and hazardous or illegal materials.

Objective L	Forensic and investigations capabilities
Context:	We need to be able to use information to deliver forensic and investigative support to our national security and law enforcement agencies to result in fair and just prosecution in courts of law. New technologies are needed to enable the 'in-field' screening and analysis of evidence to provide fast, accurate, scientific information to support the investigation.
Objective for science and innovation:	To develop smarter tools and methods to detect, observe, monitor and identify entities of interest or concern.
Key tasks for achieving the objective:	L1. Developing new technologies and methods for evidence assessment and collection; and L2. Developing remote, portable and robotic systems, including deployable diagnostic and analytical systems.



3 Identifying and resourcing science and innovation capabilities



3 Identifying and resourcing science and innovation capabilities

The evolving national security environment requires us to draw on existing science and innovation capabilities and develop new science and innovation capabilities in a timely and coordinated manner. This Chapter outlines where relevant science and innovation is currently undertaken and the approach that will be taken to enhance these capabilities.

3.1. Existing science and innovation capabilities

Australia has significant science and innovation capabilities that can be applied to national security. We undertake world-leading national security science and innovation through Australian Government agencies, universities and the private sector.

3.1.1. Science and innovation capabilities within Australian Government research agencies

The Australian Government invests over $2 billion annually in science and innovation outcomes through its research agencies. A number of research agencies undertake science and innovation vital to our national security:

- The Australian Institute of Criminology provides analysis of complex and sophisticated criminal activity, including economic crime, high-tech and cyber crime, transnational and organised crime, money laundering and crimes against the environment and natural resources.
- The Australian Nuclear Science and Technology Organisation supports national security through its nationally unique capability to deliver nuclear scientific and technological research for both nuclear-related requirements and enhancements to screening and detection technologies.
- The Commonwealth Scientific and Industrial Research Organisation already addresses a range of traditional and new national security areas in its research, including in animal and plant biosecurity, sensor networks and automated biological and chemical detectors, intelligent information and communication technology, and disease spread forecasting.
- The Defence Science and Technology Organisation supports civilian national security requirements through leveraging defence-related research and development capabilities, including in chemical, biological and nuclear defence; explosives effects and improvised explosive devices; intelligence-related technologies; and cyber security.
- Geoscience Australia contributes to the Critical Infrastructure Protection Modelling and Analysis program managed by the Attorney-General's Department, while its broader program of work on earth monitoring, natural hazards, energy security and geospatial data has a growing role to play in enabling our responses to new and emerging threats to national security.
- National Information and Communications Technology Australia contributes to national security research in areas such as the enhancement of intelligent CCTV systems and evaluation and enhancement of current wireless mesh technologies to assist emergency services.
- The National Measurement Institute delivers essential services that have national security relevance, including chemical and biological analysis, pattern approval testing and supporting to Australia's standards and conformance infrastructure.

Cumulatively, these agencies represent a critical mass of multi-disciplinary expertise and resources unrivalled in Australia. In future, the contribution of these agencies will continue to develop to meet the expanding range of national security challenges.

Publicly-Funded Agencies Collaborative Counter-Terrorism (PACCT) program

The Publicly-Funded Agencies Collaborative Counter-Terrorism (PACCT) program was established in 2005 to enhance collaboration between research and counter-terrorism agencies. The program significantly enhanced our counter-terrorism efforts by identifying and drawing on capabilities within research agencies.

Science and innovation agencies

- Australian Nuclear Science and Technology Organisation
- Commonwealth Scientific and Industrial Research Organisation
- Defence Science and Technology Organisation
- Geoscience Australia
- Department of Innovation, Industry, Science and Research

Agencies involved with counter-terrorism

- Attorney-General's Department
- Australian Customs and Border Protection Service
- Australian Federal Police
- Australian Security Intelligence Organisation Department of Defence
- Department of the Prime Minister and Cabinet
- Office of Transport Security

The strengths of this program will be built on through the establishment of the National Security Science and Innovation Steering Committee, which will subsume the PACCT program and bring together a broader range of agencies to focus on the national security objectives for science and innovation.

3.1.2. Science and innovation capabilities within national security agencies

A number of national security agencies have their own science and innovation capabilities and infrastructure. For instance, the Australian Federal Police has established capabilities in forensic science, explosives and Chemical, Biological, Radiological and Nuclear data and high-technology crime. Other agencies have the application of science and innovation to national security as a central role. For example, the primary task of CrimTrac is to develop systems for sharing law enforcement information. All such agencies share the insights they produce with the broader national security community.

3.1.3. Science and innovation capabilities within Australian universities

While fundamental research is a core strength of the academic sector, Australian universities are also highly adept at the development of ready-to-use prototypes, tools, methodologies and information. A number of universities have established centres dedicated to national security-related research (see the National Security Science and Innovation Directory at Attachment A for further information). In addition to these capabilities, the majority of Australian universities have programs of particular relevance to national security.

Indicatively, the Department of the Prime Minister and Cabinet has engaged with 27 universities in Australia, through workshops and the Research Support for Counter-Terrorism funding program. The states and territories have also forged strong relationships with local universities, providing guidance on policy, priorities, funding and partnerships. Many centres have significant state government funding and rely on partnerships with state police, health, emergency services and others to undertake research.

3.1.4. Science and innovation capabilities within the private sector

Industry undertakes approximately sixty percent of Australia's research, predominantly focussed on applied research. The capabilities that underpin this work are spread across a diverse range of organisations of differing size across multiple sectors. Small to medium enterprise firms have driven the delivery of novel technologies and analytical work, while larger enterprises have also been able to adapt global advances in knowledge for Australian conditions.

The private sector plays two further essential roles in national security science and innovation. First, as owners and operators of critical infrastructure (including utilities, transport and communications), private sector organisations can drive the uptake of new technology and knowledge. Second, private sector organisations are essential to the commercialisation of research (see Chapter 5).

3.2. Resourcing and developing science and innovation capabilities

Developing new science and innovation capabilities requires significant resources. Capability development decisions need to be based on a detailed understanding of required objectives (see Chapter 2) and existing capabilities and capacities (see below). Combining these factors, we can plan where we need to develop new capabilities or capacity and where it is critical that we maintain support to existing capabilities. Figure 2 illustrates this process.

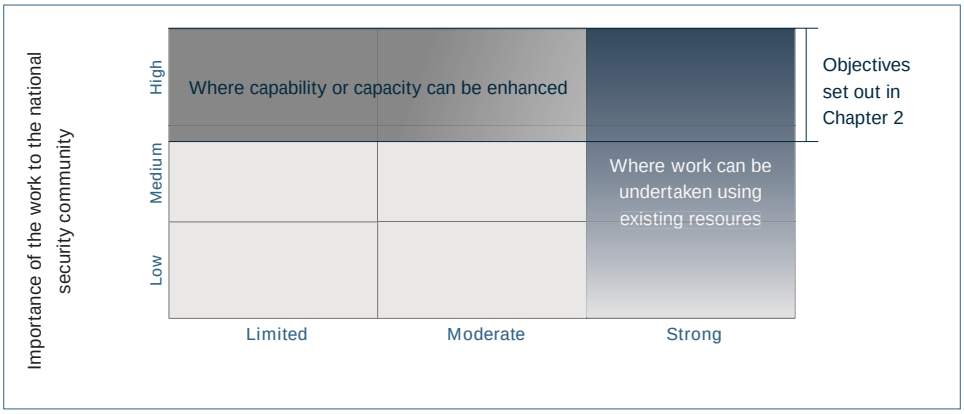


Figure 2. Identifying opportunities for enhancing science and innovation capabilities

3.2.1. Gaining a more detailed understanding of our science and innovation capabilities

A detailed understanding of the current capacity of the science and innovation community to undertake tasks relevant to national security will allow linkages to be established and underpin the development of future capabilities. The Australian Government will work to improve its knowledge of existing relevant science and innovation capabilities through:

- Improving information sharing across relevant Australian Government agencies via the National Security Science and Innovation Steering Committee.
- Building our understanding of university capabilities through the Excellence in Research for Australia initiative, which will be used by the Australian Research Council from 2010.
- Developing our understanding of private sector capabilities through sectoral surveys (surveys previously undertaken by the E-Security Policy and Coordination Committee and the Research Network for a Secure Australia offer a model for a decentralised approach to this task).

3.2.2. Opportunities for the enhancement of science and innovation capabilities

Detailed analysis of current capability and objectives will identify specific opportunities for capability development. However, the Australian Government has already identified that three of the twelve national security objectives for science and innovation (see Chapter 2) require general capability enhancement:

- Policies and standards
  There is significant scope for improving the resourcing of analytical work, which contributes to the evidence base for policy development and better coordination of the resources being applied.
- Forecasting, modelling and risk assessment
  While strong work in this area already informs policy, there is significant scope for increasing the capacity to undertake work of this kind through additional funding and enhanced coordination.
- Cyber protection and electronic security
  Protecting our information infrastructure has been identified as a specific national priority, requiring increased resources and coordination for underpinning science and innovation.

3.2.3. Resourcing for science and innovation capabilities

The annual coordinated national security Budget process will allow consideration of funding proposals focused on the enhancement or creation of required science and innovation capabilities. The need for specialised capabilities may be identified through strategic analysis and endorsed by peak committees. Responsibility will remain with interested agencies to develop strong and competitive funding proposals.

The Australian Government, through the National Collaborative Research Infrastructure Strategy, is providing $542 million between 2005 and 2011 to establish major research facilities, infrastructure and networks in priority fields. The National Security Science and Innovation Steering Committee will work within this related strategy to ensure the national security community makes a coordinated contribution to future reviews or roadmaps.

3.2.4. Establishing new capabilities

New capabilities can be independently established and managed by national security agencies, however greater efficiency will often be derived by using existing science and innovation structures. This can include working with established bodies, such as Australian Government research agencies or universities, or utilising programs established to develop particular capabilities to address national challenges.

The Cooperative Research Centres program creates new capabilities to address major national challenges requiring medium to long term collaborative efforts. Funding rounds are now being held annually for the program. The Australian Research Council supports Centres of Excellence which bring together collaborative research groups in areas of national priority. The Council is planning to conduct a new round of funding for Centres commencing in 2011.

Should the national security community identify an opportunity to leverage the expertise or resources of these programs, the National Security Science and Innovation Steering Committee will lead necessary engagement. Funding can be provided through the programs or via direct support by the national security community. The Defence Materials Technology Centre is an example of a facility developed using science and innovation program expertise and direct funding from the Department of Defence.

3.2.5. Enhancing science and innovation capabilities through improved coordination

In some cases, Australia may have elements of a capability that are dispersed geographically, between institutions or across sectors. In these instances, it may not be necessary to expend significant resources establishing a new capability. Instead, where possible, results will be delivered through enhancing coordination.

The Australian Research Council has established a number of research networks to encourage collaborative approaches in inter-disciplinary settings. As well as the Research Network for a Secure Australia, a number of other networks listed in the National Security Science and Innovation Directory cover relevant areas of science and innovation.

The national security community has also already established a number of cross-sector groups, including through the Trusted Information Sharing Network for critical infrastructure protection. As part of the Network's activities, Expert Advisory Groups have been established to consider information technology security and horizon scanning. Where appropriate, other national security agencies and committees will use cross-sectoral groups to support science and innovation prioritisation, investment or application.

3.2.6. Identifying and supporting critical science and innovation capabilities and infrastructure

Separate to the development of capabilities to deliver broad outcomes, we also need to maintain and enhance certain specialised infrastructure and niche capabilities which are critical to national security. A National Security Critical Science and Innovation Infrastructure Register will be established to identify these critical capabilities, such as particular laboratories or facilities. The Register will be a mechanism for prioritising funding for the maintenance and enhancement of such infrastructure.

4 Prioritising and resourcing science and innovation activities

4 Prioritising and resourcing science and innovation activities

Public funding must always be used effectively and efficiently. This includes in supporting prioritised national security science and innovation activities. The science and innovation and national security communities each have their own mechanisms for resource allocation and will work together to ensure a coordinated approach. This Chapter outlines the processes by which this will be achieved.

4.1. Identifying and prioritising activities

National security agencies will routinely identify how science and innovation can be applied to enhance their capabilities. Peak inter-departmental committees will then prioritise these requirements to facilitate the most effective science and innovation application across a community, sector or subject. These processes will be regularly refined to ensure priorities are:

- identified through, and integrated with, broader capability development, strategic prioritisation and resource allocation processes;
- balanced appropriately between the operational needs of individual agencies and broader strategic priorities, as well as between short, medium and long term requirements;
- developed in conjunction with the science and innovation community to ensure they are achievable and expressed in a manner that is both useful to a science and innovation audience and not so prescriptive as to limit novel or alternative solutions; and
- risk-informed, evidence-based and developed in a logical, transparent and auditable manner.

Each year, the Australian Government will compile and publish its Annual Statement of National Security Science and Innovation Priorities (see Figure 3). This will inform the science and innovation community of the priority work required to achieve the objectives set out in Chapter 2.

4.2. Resourcing activities

A number of Australian Government funding programs exist that can support national security-related science and innovation activities. Some of these are targeted directly at national security-related science and innovation, while others provide support across broader domains.

The national security community will work more closely with these programs to ensure relevant work is being appropriately resourced and delivered. This is consistent with the first National Innovation Priority which requires that "public research funding supports high-quality research that addresses national challenges" (see Chapter 7 for further information on the National Innovation Priorities).

The Annual Statement of National Security Science and Innovation Priorities will inform these Australian Government funding programs of current requirements and assist them in targeting their support appropriately. The National Security Science and Innovation Steering Committee will also be available to provide expert advice on the national security relevance of applications for funding from these programs.

1. Prioritisation of requirements

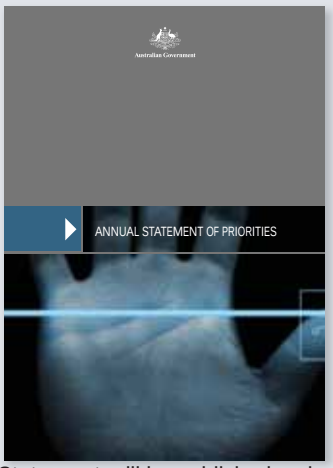
The following committees will be approached for advice on their priorities

Cross-jurisdictional committees	Australian Government committees
Transport Security Standing Committee on Transport	Border and Maritime Security Joint Agencies Maritime Advisory Group
Identity Security National Identity Security Coordination Group	Oranised crime Commonwealth Operational Law Enforcement Agencies
Counter-terrorism National Counter-Terrorism Committee	Intelligence National Intelligence Coordination Committee
Health Protection Australian Health Protection Committee	E-Security E-Security Policy and Coordination Committee
Emergency Management Australian Emergency Management Committee	
Cross-sector committees	**Cross-community requirements**
Aviation Security Aviation Security Advisory Forum	Horizon Scanning National Security Science and Innovation Steering Committee
Critical Infrastructure Protection Critical Infrastructure Advisory Council	Cross-Cutting Requirements National Security Science and Innovation Steering Committee

2. Development of the Annual Statement

Priorities collated by the Department of the Prime Minister and Cabinet	Reviewed by the National Security Science and Innovation Steering Committee	Endorsed at an inter-departmental meeting of senior national security officials

3. Publication of the Statement



Statement will be published and made available online for viewing by objective or committee.

Figure 3. How the Annual Statement of National Security Science and Innovation Priorities will be produced

4.2.1. Direct support by national security agencies

Individual agencies within the national security community may directly support science and innovation activities. This is a well understood mechanism for national security capability enhancement which is used by a number of agencies. Where this support requires new funding, agencies can bring forward prioritised proposals through the coordinated national security Budget process.

4.2.2. Targeted research programs

Since 2006, the Research Support for Counter Terrorism grants program has supported short- to medium-term research and development activities which enhance counter-terrorism capabilities. It has a strong emphasis on implementing research. From 2009, the program will expand to incorporate all national security science and innovation activities and be renamed the Research Support for National Security program. It will continue to be administered by the Department of the Prime Minister and Cabinet.

The Criminology Research Council will continue to provide research grants to public policy-relevant projects that make an original contribution to criminological knowledge and have practical application. This includes research that assists in the development of new policies or procedures, crime reduction strategies and legislative reform proposals.

4.2.3. General research programs

The Australian Research Council and the National Health and Medical Research Council provide funding for research across the full spectrum of scientific and humanities fields (approximately $1.5 billion for 2009–10). The Councils administer funding through multiple grant programs for exploratory and collaborative research and for Centres of Excellence.

Science and innovation funded by the Councils will continue to be assessed primarily on research excellence. However, the National Security Science and Innovation Steering Committee will work to ensure due consideration is given to the national benefit of supporting prioritised national security science and innovation activities.

The objectives set out in Chapter 2, as refined and developed by the Annual Statement of National Security Science and Innovation Priorities, will inform the Councils' judgements with regard to the funding of research under the National Research Priorities, particularly Safeguarding Australia (see Chapter 7 for further information on the National Research Priorities).

How science and innovation enhances national security:

Australian scientists set universal customs X-ray standards

The first international standards for testing equipment used to examine large cargo objects has been designed and developed by Australian scientists working with the Office of Transport Security. The project developed new methods to test the accuracy and reliability of X-ray machines. This will lead to improvements to equipment and better border security.

4.2.4. Other science and innovation funding mechanisms

The Australian Government, through its innovation policy, *Powering Ideas: An Innovation Agenda for the 21st Century,* has set out a number of other mechanisms for supporting science and innovation. This includes the introduction from 2010 of a simplified Research and Development Tax Credit scheme which provides incentives for business to invest in research and innovation.

International collaboration can also support relevant science and innovation activities. The Australian Government maintains a number of international science and innovation agreements to foster general linkages and specific national security science and innovation cooperation. As an example of the former, the Department of Innovation, Industry, Science and Research operates the International Science Linkages program to support international collaborative research projects. As an example of the latter, the Department of the Prime Minister and Cabinet maintains two agreements with the United States Departments of Defense and Homeland Security to facilitate counter-terrorism and homeland security collaborative research.

5 Transitioning science and innovation into national security capabilities

5 Transitioning science and innovation into national security capabilities

Science and innovation outputs can be adapted and applied in many ways to enhance our national security. They can inform policies, standards or procurement decisions or be turned into tools, techniques or best practice guidelines. However they may be used, these outputs will invariably have to be converted into a form that can be used by the national security community. This conversion process, particularly when creating new products through commercialisation, can be difficult and often requires significant investments of time and resources. It is a challenge common to all forms of innovation.

5.1 Adapting and applying science and innovation

In *Powering Ideas, An Innovation Agenda for the 21st Century*, the Australian Government recognised this need for an "innovation system that offers an unbroken path from vision to realisation". The Australian Government committed to supporting this system in a number of ways, including through the Enterprise Connect program and the establishment of Commercialisation Institute Australia. These initiatives provide support to organisations in taking their science and innovation to the marketplace.

The application of science and innovation to national security will be enhanced through these system-wide measures and specific actions to improve collaboration, partnerships and planning. The issue will remain an ongoing challenge and will be regularly considered by the National Security Science and Innovation Steering Committee.

5.2. The role of the national security community

National security agencies or committees will ensure the science and innovation activities they invest in are integrated with broader capability development processes and able to be transitioned to a usable form. Consideration of these factors from the outset of an activity will minimise risk and ensure the effective and efficient use of resources.

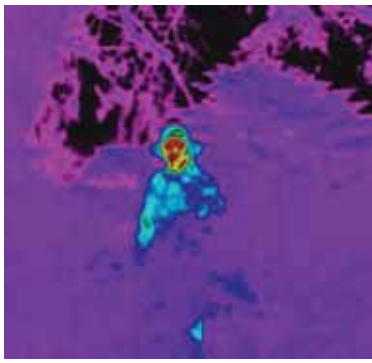
Developing roadmaps are a proven project management tool that can be applied to this task. Agencies or committees can set out how an activity will progress from research to end-use, and the intermediate steps and partnerships this may require. This is not only beneficial for the specific activity, but can help the outcomes be integrated into broader capability development plans and timelines.

New measures to increase coordination within the national security community will provide strong incentives for the national security community to develop mature and robust techniques for converting research to use. Through the coordinated budget process, prioritisation will be able to be given to funding proposals which offer a pathway from science and innovation investment through to capability enhancement. Through community performance evaluation mechanisms, systemic failures to convert science and innovation outputs into capability enhancements will be able to be identified.

5.2.1. Sharing outcomes

Science and innovation outcomes need to be shared as widely as possible across the national security community. Multiple agencies will often have an interest in an outcome and be able to apply the new knowledge or technologies in a novel manner. The National Security Science and Innovation Steering Committee and its working groups will provide a forum for this information sharing. The ongoing involvement of national security committees in the annual prioritisation process will also facilitate the sharing of outcomes.

5.2.2. Drawing on existing linkages



Commonwealth, state and territory government agencies involved in national security already have strong links with the private sector. This has occurred through direct collaboration and through initiatives such as the Trusted Information Sharing Network for critical infrastructure protection. The Australian Defence Organisation has developed strong links with its supporting industries and established a number of successful engagement programs. These include the Capability Technology Demonstrator and the Rapid Prototyping, Development and Evaluation programs, which facilitate the transition of new knowledge and technologies into capabilities.

The national security community will analyse how it can leverage these existing linkages and where it can establish new, independent programs. Consideration will include how to resource these engagement efforts, including meeting the costs of participation in existing programs.

5.3. The role of the science and innovation community

Within the science and innovation community, the private sector has the most significant role to play in transitioning research into usable products and services. Other members of the community can also assist with this process through sharing outcomes and establishing connections to facilitate the smooth transition of their outputs into use.

5.3.1. The role of the private sector

The transformation of new knowledge and technologies into a commercial form is a defining element of the private sector's work. As set out in *Powering Ideas, An Innovation Agenda for the 21st Century*, the Australian Government aims to double the level of collaboration between Australian businesses and our universities and publicly-funded research agencies over the next decade.

The national security community will look to enhance linkages with the private sector and develop partnerships to enable commercialisation. This will include through encouraging greater participation by industry representatives in expert and thematic working groups. The national security community will explore opportunities for more formal linkages with industry or the use of targeted funding to support technology and knowledge transfer.

How science and innovation enhances national security:

Population responses to chemical, biological, radiological and nuclear events

People are likely to respond in different ways to a chemical, biological or radiological event, compared with their response to a flood or cyclone. An Australian university, working with first responders and other national security agencies has developed a field guide for first responders which provides advice to them for their interaction with the public in such circumstances.

5.3.2. The role of the research community

Beyond the commercialisation process, other members of the science and innovation community can enhance the adoption of their work for national security purposes. A significant proportion of the science and innovation activities relevant to national security will not be directly commissioned by the community. Some activities will be independently undertaken on the basis of perceived need or the information contained in this Strategy or the Annual Statement of National Security Science and Innovation Priorities. Other activities will have been conducted without considering national security requirements but are of relevance to the national security community.

It is important that the individuals and groups responsible for these activities inform the national security community of their potential use and benefit. The National Security Innovation Conference and Exhibition, the new online portal and the Department of the Prime Minister and Cabinet's university engagement program will facilitate this (see Chapter 8).

How science and innovation enhances national security:

Defeating large vehicle bombs

Australian scientists working with Defence, the AFP and State bomb response units have developed a prototype capability to defeat Large Vehicle Borne Improvised Explosive Devices. The device can be attached to the suspect vehicle with a robotic device and disrupts the IED detonation mechanism with a very high powered and directed jet of water.

6 Working with the national security community

6 Working with the national security community

The inaugural National Security Statement and the Homeland and Border Security Review emphasise the importance of coordination and collaboration. Our approach to the coordination of science and innovation within the national security community is guided by the direction and reforms presented in these documents, particularly the establishment of a National Security Strategic Policy Framework. This framework links community-wide priority setting, resource allocation and performance evaluation on an annual basis. It will be a strong driver of coherence and coordination within the national security community.

6.1. National security community coordination

The national security community's involvement in science and innovation activities will be incorporated appropriately into this Framework. This will include:

- the consideration of national security science and innovation activities within coordinated budget and performance evaluation processes; and
- the alignment of national security science and innovation business cycles with the annual prioritisation, performance review and resource mechanisms within the Framework.

6.1.1. National security committees

The National Security Committee of Cabinet is the focal point of decision making on national security (see Figure 4). It is supported by the Secretaries Committee on National Security and two policy groups:

- the Strategic Policy Coordination Group (SPCG), which focuses on enhancing whole-of-government interaction on strategic international and security issues; and
- the Homeland and Border Security Policy Coordination Group (HPCG), which focuses on initiating, and supporting the delivery of, whole of government policy on matters pertaining to Australia's homeland and border security.

The SPCG and HPCG hold combined meetings regularly to consider matters relating to the National Security Strategic Policy Framework and will consider science and innovation within this context. They will consider the Annual Statement of National Security Science and Innovation Priorities and the National Security Critical Science and Innovation Infrastructure Register.

A number of other committees coordinate our response to specific challenges or bring together particular communities. As can be seen in Figure 4, some of these are focused on Australian Government coordination, while other committees are cross-jurisdictional or involve private sector representation. As outlined in Chapter 4, consideration of science and innovation priorities by these committees will be regularised through the Annual Statement of National Security Science and Innovation Priorities.

How science and innovation enhances national security:

Blast resistant glass

Flying glass after a city bomb blast can cause horrible injuries or death. Collaboration between universities from Australia and the United States of America have produced an entirely new glass panel, able to withstand the blast from half a kilo of high explosive from a distance of only 3 metres.

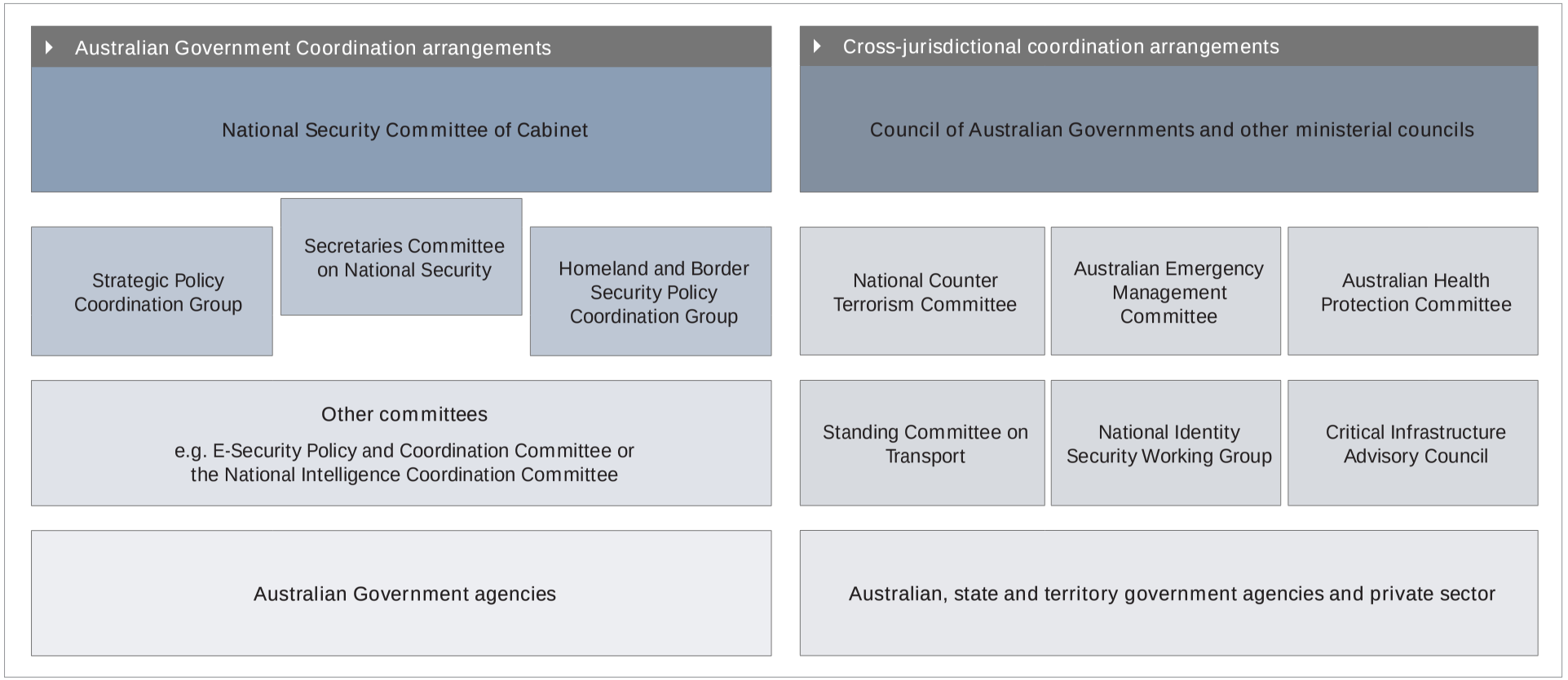


Figure 4. Australian Government and cross-jurisdictional arrangements

6.2. Role of the Department of the Prime Minister and Cabinet

The Department of the Prime Minister and Cabinet, particularly through the National Security Adviser, will take a leading role in the coordination of science and innovation for the national security community.

6.2.1. The National Security Adviser

The National Security Adviser provides direct advice to the Prime Minister on policy matters relating to the nation's security. This involves engagement with senior representatives of government agencies across all jurisdictions, as well as with key representatives from business, industry and academia. Where appropriate, the National Security Adviser will promote and advance national security science and innovation priorities.

6.2.2. The National Security Science and Technology Branch

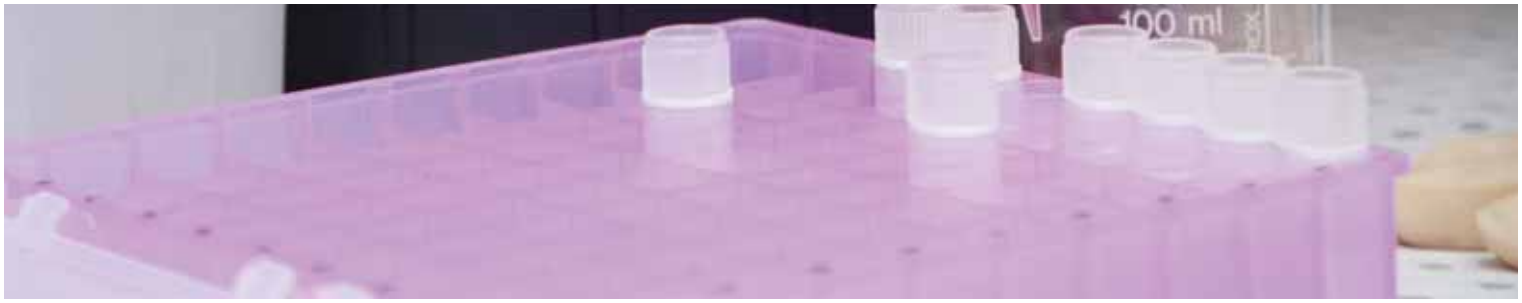
The National Security Science and Technology Branch within the Department will continue to provide a national focus for national security science and innovation. It will collate, contribute to and lead dissemination of the Annual Statement of National Security Science and Innovation Priorities. It will also provide secretariat and policy support to relevant committees. The work and role of the Branch will evolve as it leads the implementation of this Strategy and the incorporation of science and innovation into ongoing national security coordination, funding and performance evaluation processes.

6.3. International partnerships

Australia contributes to, and benefits from, global developments in science and innovation relevant to national security through working with its international partners. The national security community maintains a number of agreements which allow it to share information and work collaboratively in this way. This includes through partnering on collaborative activities, information-sharing, workshops and staff exchanges.

Two critical factors will drive our involvement in new arrangements. First, the need to access international science and innovation capabilities which complement or enhance our own. Second, the capacity for Australia to contribute effectively to the international partnerships and alliances that form an enduring element of protecting our national security.

7 Working with the science and innovation community



7 Working with the science and innovation community

The Australian Government's innovation policy, *Powering Ideas, An Innovation Agenda for the 21st Century* has set out a reform agenda for our national innovation system. National security science and innovation will be appropriately incorporated into these reforms.

7.1. Department of Innovation, Industry, Science and Research

The Department of Innovation, Industry, Science and Research provides leadership for the Australian Government's science and innovation efforts. It has portfolio responsibility for policy and program coordination that supports science and innovation.

The Department contributes to the coordination of national security-related science and innovation activities and will be represented on the new National Security Science and Innovation Steering Committee.

7.2. Chief Scientist for Australia

The Chief Scientist for Australia provides independent advice to Government on a wide range of scientific and technological issues and engagement with the science, research and industry communities and other governments. The national security community will look to engage more actively with the Office of the Chief Scientist for Australia.

7.3. Research Councils

The Australian Research Council and the National Health and Medical Research Council are major linkages between the Australian Government and the science and innovation community. Through their administration of research funding programs these Councils gain visibility of the capabilities and activities of the Australian research sector. Representatives of the Councils will be invited to join the National Science and Innovation Steering Committee. The Committee will work with the Councils to:

- Provide expert advice, as appropriate, on the relevance and the national security merit of funding applications.
- Gain a greater understanding of university capabilities through the Excellence in Research initiative;
- Investigate how self-reporting mechanisms for funding applicants can be enhanced to provide the national security community with a clearer picture of relevant research; and
- Share information on research outcomes.

7.4. Coordinating bodies

The Prime Minister's Science, Engineering and Innovation Council is made up of ministers and representatives of science and innovation agencies and industry organisations. It is a principal source of independent advice to Government on science, innovation and relevant aspects of education and training. The Coordination Committee on Innovation brings together Australian Government agencies that produce and use science and innovation to improve coordination of policies and programs.

The Australian Government will ensure that the national security community is suitably represented in the membership and work of these bodies. This task will be taken forward by the Department of the Prime Minister and Cabinet and the Office of the Chief Scientist for Australia.

7.5. National Research Priorities

The National Research Priorities highlight areas of particular social, economic and environmental importance where focus can improve research and broader policy outcomes. As set out in the table below, the science and innovation objectives identified in Chapter 2 are reflected across these Priorities.

<table>
<tr><td colspan="2">▸ National Research Priority 1: An Environmentally Sustainable Australia</td></tr>
<tr><td colspan="2">This Priority includes improving understanding of the impact of climate change.
National security aspects of this task are addressed in:
– Areas of emerging national security concern (Objective D)
– Forecasting, modelling and risk assessment (Objective E)</td></tr>
<tr><td colspan="2">▸ National Research Priority 2: Promoting and Maintaining Good Health</td></tr>
<tr><td colspan="2">This Priority includes the role of health protection, including pandemic disease. Modelling, emergency management and risk communications are addressed within:
– Social resilience (Objective C)
– Areas of emerging national security concern (Objective D)
– Forecasting, modelling and risk assessment (Objective E)
– First responder capabilities (Objective F)</td></tr>
<tr><td colspan="2">▸ National Research Priority 3: Frontier Technologies for Building and Transforming Industries</td></tr>
<tr><td colspan="2">This Priority focuses on emerging and frontier technologies. The national security opportunities and challenges created by these technologies for our physical and information infrastructure are addressed within:
– Cyber protection and electronic security (Objective A)
– Physical resilience (Objective B)
– Information management and sharing (Objective G)
– Surveillance, detection and identification (Objective K)</td></tr>
<tr><td colspan="2">▸ National Research Priority 4: Safeguarding Australia</td></tr>
<tr><td colspan="2">This Priority is of primary relevance to national security science and innovation and is made up of five goals:</td></tr>
<tr><td>(a) Protecting Australia from terrorism and crime</td><td>A major focus for national security science and innovation, addressed across all objectives.</td></tr>
<tr><td>(b) Protecting Australia from invasive diseases and pests</td><td>Health protection and biosecurity capabilities are addressed within:
– Areas of emerging national security concern (Objective D)
– Forecasting, modelling and risk assessment (Objective E)
– First responder capabilities (Objective F)
– Surveillance, detection and identification (Objective K)</td></tr>
<tr><td>(c) Understanding our region and the world</td><td>The need for an increased understanding of social and environmental factors is addressed within:
– Policies and standards (Objective I)
– Social resilience (Objective C)
– Areas of emerging national security concern (Objective D)</td></tr>
<tr><td>(d) Securing our critical infrastructure</td><td>Another major focus for national security science and innovation, particularly addressed in:
– Cyber protection and electronic security (Objective A)
– Physical resilience (Objective B)</td></tr>
<tr><td>(e) Developing transformative defence technologies</td><td>Primarily covered by the Defence White Paper and the defined role of the Defence Science and Technology Organisation</td></tr>
</table>

Table 2. The representation of national security science and innovation objectives across the National Research Priorities

7.6. National Innovation Priorities

The Australian Government has adopted seven National Innovation Priorities to focus the production, diffusion and application of new knowledge. As demonstrated in the following table, this Strategy is integrated and accords with the National Innovation Priorities.

The National Innovation Priorities	How the National Security Science and Innovation Strategy integrates with the National Innovation Priorities
Priority 1: Public research funding supports high-quality research that addresses national challenges and opens up new opportunities.	Chapter 2 sets out the national challenges that science and innovation can address in national security. Chapters 3 and 4 address funding issues.
Priority 2: Australia has a strong base of skilled researchers to support the national research effort in both the public and private sectors.	Chapter 3 describes how capability and capacity can be enhanced to deliver science and innovation outcomes for national security.
Priority 3: The innovation system fosters industries of the future, securing value from the commercialisation of Australian research and development.	Chapter 5 describes the key role of the private sector in developing innovation and encouraging commercialisation
Priority 4: More effective dissemination of new technologies, processes, and ideas increases innovation across the economy, with a particular focus on small and medium-sized enterprises.	Chapter 5 describes adoption and up-take mechanisms for new ideas. Chapter 8 describes specific mechanisms to encourage the dissemination of ideas and technologies between sectors.
Priority 5: The innovation system encourages a culture of collaboration within the research sector and between researchers and industry.	Chapter 8 outlines mechanisms to encourage collaboration within the national security science and innovation community
Priority 6: Australian researchers and businesses are involved in more international collaborations on research and development.	Chapter 6 outlines the need to engage with our international partners on science and innovation collaboration
Priority 7: The public and community sectors work with others in the innovation system to improve policy development and service delivery.	Chapter 8 describes the policy interface between the national security and science and innovation communities.

Table 3. The integration of the Strategy with the National Innovation Priorities

8

Bringing the communities together

8 Bringing the communities together

The success of this Strategy is dependent on strong collaboration and effective communication between the national security and the science and innovation communities. These two factors allow us to align efforts, share knowledge and work together to deliver better outcomes (see Figure 5). While the Australian Government has a central role to play in these tasks, the involvement and contribution of universities and the private sector will remain essential.

8.1. Fostering collaboration

Beyond the structural and policy reforms set out in the previous chapters, the Australian Government will also introduce the following measures to enhance communication and cooperation between the communities at various levels.

8.1.1. Bringing experts together

The Australian Government will encourage opportunities for experts to come together and contribute to the development of evidence-based solutions to policy and technical challenges. These opportunities will be facilitated in a number of ways:

- Publicly-Funded Research Agencies, research networks or Centres of Excellence convening fora or working groups on emerging challenges within their area of expertise;
- National security agencies or committees using scientific advisory panels or expert working groups to support specific programs or advise on science and innovation prioritisation;
- The National Security Science and Innovation Steering Committee establishing thematic working groups on cross-cutting science and innovation challenges; and
- The Department of the Prime Minister and Cabinet will continue to organise a program of workshops to support its domestic and international programs.

The National Security Science and Innovation Steering Committee and the Department of the Prime Minister and Cabinet will support organisations or agencies convening working groups, fora or workshops by providing advice on potential members and the sharing or distribution of outcomes.

8.1.2. National Security Science and Innovation Advisory Board

A National Security Science and Innovation Advisory Board will be established to allow senior industry, university and research representatives to provide independent evaluation of the Strategy, including progress toward the national security objectives for science and innovation. The Board will meet annually and be chaired by the National Security Adviser, who will also provide updates on national security priorities and developments. The Chief Scientist, the Chief Defence Scientist, the Chief Executive Officer of the Australian Research Council, as well as private sector, university and research institute representatives, will be invited to be members.

8.1.3. National Security Science and Innovation Steering Committee

The National Security Science and Innovation Steering Committee will bring together relevant Australian Government agencies. It will create a method for collaboration and enhance consistency in approaches to national security science and innovation. As described in Chapter 6, the Committee will report to joint meetings of the Homeland and Border Security Policy Coordination Group and the Strategic Policy Coordination Group. It will bring forward to this forum the Annual Statement of National Security Science and Innovation Priorities and the National Security Critical Science and Innovation Infrastructure Register.

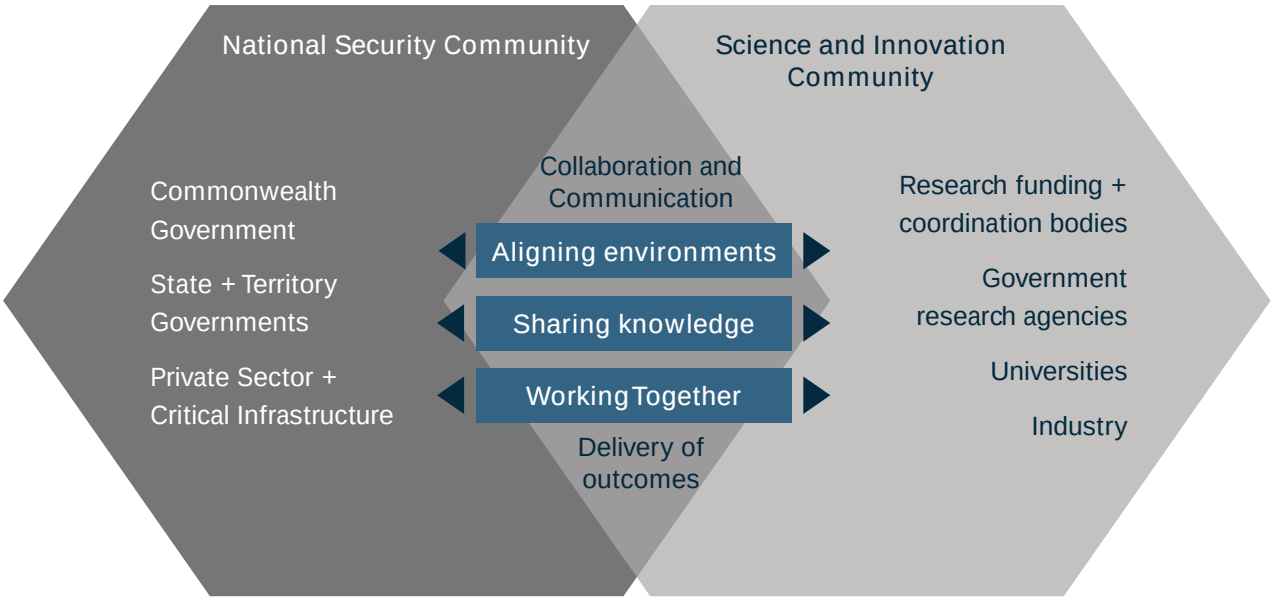


Figure 5. Bringing the national security and science and innovation communities together.

The Committee will subsume the role and build on the work of the Publicly-Funded Agencies Collaborative Counter Terrorism (PACCT) Steering Committee. This expanded ambit and membership supports the recommendations of the Homeland and Border Security Review.

Thematic working groups will be established by the Committee as required. These were one of the most successful elements of the PACCT program and provide a forum for the development of activities in areas of particular importance.

8.2. Improving communication

Improving the effectiveness of communication at all stages of engagement between the two communities will further enhance the application of science and innovation to national security. This commences with the dissemination of priorities and continues through to the effective sharing and application of outcomes.

8.2.1. Dissemination of priorities

Publication of the Annual Statement of National Security Science and Innovation Priorities will be the primary tool for informing the science and innovation community of the requirements of the national security community. The Statement will be provided to research councils and distributed across the science and innovation community. This will enhance both the formal incorporation of the priorities in science and innovation funding programs and the uptake of relevant work by research practitioners.

8.2.2. Leadership from Government

A Parliamentary Secretary to the Prime Minister provides oversight of the National Security Science and Technology Branch within the Department of the Prime Minister and Cabinet. This role includes promoting the importance of Australian national security science and innovation to industry and research organisations and our international partners. The Parliamentary Secretary's efforts in this regard are focussed on increasing public awareness of national security science and innovation priorities and achievements.

8.2.3. National Security Science and Innovation Conference and Exhibition

The Australian Government will host an annual National Security Science and Innovation Conference and Exhibition to foster relationships between national security agencies and research providers. The purpose will be to identify opportunities for collaboration, and to demonstrate new technologies and research outcomes. This event will be timed to coincide with the announcement and release of the annual Statement of National Security Science and Innovation Priorities.

8.2.4. Improved web presence

The Australian Government will establish a single website that brings together all relevant information on national security science and innovation priorities, funding and collaboration opportunities, and progress towards the national security science and innovation objectives.

As proposed in the Homeland and Border Security Review, the Australian Government will also establish an interactive online network or portal for those involved in national security science and innovation. This will allow continuous and more targeted communications and direct information exchanges to occur between interested parties on specific topics.

8.2.5. Communicating about sensitive projects

Many new ideas relevant to national security can be developed without requiring access to classified information. Where possible, Australian Government agencies will describe their requirements in an unclassified form. Where required, we will communicate with science and innovation community members on how to can obtain appropriate clearances or work with classified information at secure facilities.

9 The Way Forward

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9.1. Implementing the Strategy

A detailed Implementation Plan has been separately developed to support this Strategy. All new processes and mechanisms detailed in the Strategy will be established over the next twelve months, the majority within the next six months. Further enhancements will be delivered by ongoing performance evaluation and monitoring. The Strategy has been developed with a five-year horizon, however, the National Security Science and Innovation Advisory Board and Steering Committee will update the Strategy as required within this period.

9.2. Monitoring performance

The effectiveness and impact of this Strategy will be evaluated by examining the science and innovation being applied to national security and the impact of the policies and processes developed through the Strategy.

9.2.1. Science and innovation evaluation

The delivery and application of relevant science and innovation will be reflected in the annual processes for prioritisation and sharing of outcomes set out in previous chapters. Through these mechanisms, the science and innovation community will be able to report outputs and demonstrate how they have interpreted and applied national security science and innovation priorities. National security agencies will also monitor their investment in, and uptake of, science and innovation through their own resource allocation and performance evaluation processes.

9.2.2. Processes evaluation

The National Security Science and Innovation Steering Committee will develop a set of metrics to measure its performance and the impact of its activities and working groups. This will include the implementation, use and uptake of the Strategy and member agency perceptions of the impact of the Committee's work and the ongoing utility of the Strategy.

9.2.3. Strategy evaluation

The impact and implementation of the Strategy will be assessed as part of new performance evaluation mechanisms being established to enhance consistency and coordination across the national security community. Evaluation will include succinct, high level reports to the National Security Adviser and the Prime Minister, capturing achievements, shortfalls and areas of concern or risk.

9.2.4. Funding evaluation

The effectiveness of the Strategy in encouraging the commissioning and funding of prioritised national security science and innovation activities will also be monitored and periodically reviewed. As part of this process, possible enhancements to the resourcing mechanisms set out in the Strategy and alternative opportunities for funding or other forms of support will continue to be considered on an ongoing basis.

Obtaining further information

For further information on the Strategy and national security-related science and innovation, enquiries can be initially directed to the National Security Science and Technology Branch within the Department of the Prime Minister and Cabinet. The website of the Branch is www.pmc.gov.au/nsst