Australian Government

Department of Defence
Strategic Policy and Intelligence Group

Australian Government

Department of Defence
Science and Technology

Shaping Defence Science and Technology in the Intelligence Domain
2016–2026

Shaping Defence Science and Technology in the Intelligence Domain 2016–2026 is the inaugural intelligence domain science and technology strategy. This outlines the S&T priorities of the Defence Intelligence Agencies.

The *2016 Defence White Paper* outlines the Government's commitment to the safety of the Australian people and to the defence of our territory and national interests. The Government is strengthening Defence's capabilities to meet future threats and challenges. Capabilities in intelligence, surveillance and reconnaissance will provide our forces with comprehensive situational awareness and cyber security capabilities will deter and defend against the increasing cyber threat. The Australian Defence Force (ADF) relies on electronic warfare capabilities to protect and defend systems in operations. Defence intelligence agencies play a major role in the provision of these future force capabilities as well as servicing the general intelligence needs of the Government. Other relevant White Paper capabilities include imagery and targeting; analytics; chemical, biological and radiological counter proliferation; and geospatial-intelligence.

The *First Principles Review* (FPR) recommendation 2.21 required Defence to review its research priorities, their alignment with future force requirements, and the capacity to leverage allied partners, industry and academia to promote innovation. To address this FPR recommendation, the Defence Science and Technology (DST) Group has worked with Defence intelligence agencies partners to identify their strategic capability needs and develop aligned Science and Technology (S&T) strategic guidance. DST Group is partnering with these agencies to support them in realising the Government's White Paper capability priorities and provide S&T support to their missions. This guidance informs DST Group's strategic investment in S&T capabilities and prioritises the S&T program to address partner agencies' needs.

This document is an overview of the classified strategic S&T guidance from the Australian Geospatial-Intelligence Organisation, the Australian Signals Directorate and the Defence Intelligence Organisation.

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# Science and Technology supporting the Defence intelligence mission

To ensure that the Defence intelligence agencies maintain their capability edge, it is important that they are supported with comprehensive, strategically aligned and prioritised science and technology that addresses capability gaps, matures technology for future capability, treats technical risk in acquisition projects, and enhances existing critical operational capability. Alignment of DST Group's S&T support will be done through the strategic guidance embodied in the following high-level priorities, expressed as focus areas from each of the agencies.

Figure 1 – Intelligence Agencies and DST Group Partnering Models

Model 1: Single deliverable, long planning and delivery time
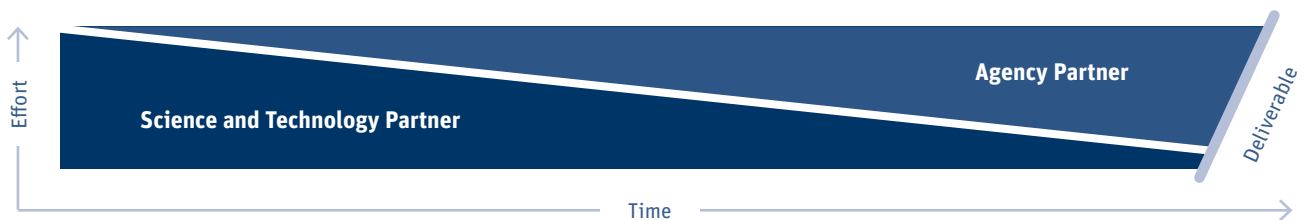
Model 2: Multiple deliverables, short planning and continual delivery
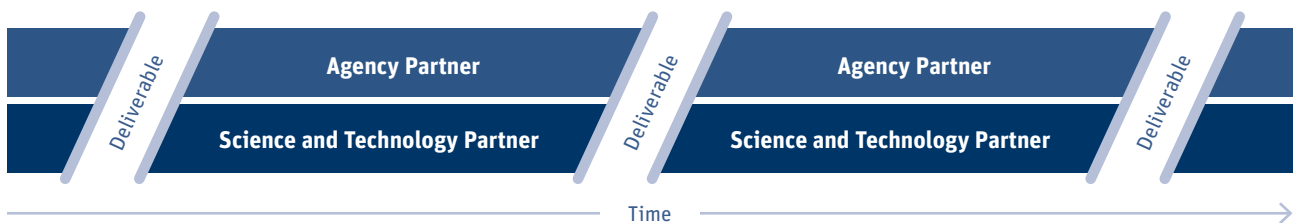
Partnering

Activities in the focus areas will be undertaken collaboratively by Defence intelligence agencies, DST Group, industry and academia, and may involve other Government national security stakeholders and Five-Eyes (FVEY) partners. Agencies will be actively engaged and will work closely with DST Group and other partners in both long-term and short-term research and development projects, as shown in Figure 1.

Model 1 represents long-term S&T where the transition to operations occurs as a gradual process, with increasing effort and responsibility on the agency to realise outcomes in the form of operational impact. This model is suited to S&T support where the starting technology is of low maturity.

Model 2 represents S&T projects that spin-off multiple deliverables throughout their life. In these projects the effort for the transition to, and the agency's responsibility for, outcomes is more regular across the life of the project. Model 2 is suited to technological innovation integration projects and may often utilise starting technologies with higher maturity. DST Group will be responsible for leading the S&T development and its application to address the strategically aligned needs of agencies.

Agencies will be responsible for providing all of the information needed to fully articulate the S&T requirements; regularly engage with their S&T projects to review and advise early if the intended deliverables will be fit for their purpose; and finally to work in partnership as the receiving organisation to transition the project outputs into operational and capability outcomes.

A Collaborative Environment

To ensure that Defence intelligence agencies are able to get the best outcomes from DST Group's partnerships, it is important that S&T projects utilise relevant compatible platforms and data representative of the agency's systems, within technical, security and legislative constraints. This is a necessary condition for projects to deliver capabilities that are fit for purpose, and have higher prospects for successful transitioning to the sponsoring agency through lower integration barriers.

Review

Defence intelligence agencies will review the focus areas of this S&T strategic guidance annually. This will ensure that the strategic guidance maintains currency and that the focus areas are still aligned with the correct strategic priorities.

An annual review will include:

- Progress against each focus area with the view of maximising the value of the sponsoring agency's S&T program;
- Resourcing arrangements and prioritisation;
- Partnering arrangements with industry and academia; and
- Maintenance of project alignment with updated strategic priorities.

Integrating S&T Themes for Intelligence Agencies

While the three Defence intelligence agencies have their specific legislative and operational roles, the necessity to provide accurate and timely intelligence to Government and the ADF means that they work closely together and contribute to common high-priority intelligence needs. Furthermore, agencies are working ever more closely with their national security partners to safeguard Australia and its national interests. The rapidly changing and evolving threat landscape is driven by disruptive technological evolution. However, more than any other domain, the combination of new technologies and cross-jurisdictional threats leads to additional challenges that can result in gaps for both policy and capability. This in itself can create technological challenges and may have an impact on the utilisation of some technologies. There are several overarching technology themes that impact across the intelligence domain. These include the increasing:

- Availability and pace-of-change of advanced technologies that can be exploited by both the intelligence agencies and our adversaries;
- Need for automation, data analytics and machine intelligence;
- Necessity for all-source multi-intelligence to solve complex intelligence problems;
- Engagement and integration with the broader national security community; and
- Emphasis on direct support to the warfighter from strategic systems.

To comprehensively address these five overarching themes, the close partnering and mutual reliance of DST Group, Defence intelligence agencies, national security agencies, industry, academia and our FVEY partners will be essential for success. DST Group, with its FPR mandated responsibility for executing the S&T mission across the Australian Defence Organisation, is uniquely placed to facilitate these partnerships. These overarching themes are recognised by the community and in this document are reflected within the individual agency's S&T strategic guidance.

The Australian Geospatial-Intelligence Organisation

Mission and Strategic Goals

The mission of the Australian Geospatial-Intelligence Organisation (AGO) is to provide geospatial-intelligence (GEOINT) for the Australian Defence and national security communities. GEOINT encompasses intelligence features and events referenced in space and time. AGO's vision is to provide 'richer and more accessible GEOINT', which will be achieved through three strategic goals[1]:

- Deliver mission-driven GEOINT ensuring its timely and accurate dissemination.
- Lead the Defence geospatial domain to provide authoritative and accessible geospatial information and services to the Australian Defence and national security community.
- Position AGO for the future in terms of data and knowledge management, analytical capability and strategic workforce development.

Focus Areas

The following science and technology focus areas align with strategic guidance and address current and future geospatial-intelligence challenges. In order to progress these strategic goals, DST Group in partnership with AGO has a robust and ongoing geospatial-intelligence S&T program, aligned with FVEY S&T activities, and covering the following priority areas:

- Advanced sensing and collection;
- Automated GEOINT processing and data fusion;
- Advanced analytics capability; and
- GEOINT innovation platform.

A detailed description of these focus areas is provided in the classified strategic guidance document.[2]

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1 *AGO Strategy 2014–18*, Australian Geospatial-Intelligence Organisation.
2 *Australian Geospatial-Intelligence Organisation – Science and Technology Strategic Guidance 2016–2026.*

The Australian Signals Directorate

Mission and Strategic Goals

The Australian Signals Directorate (ASD) mission *Reveal Their Secrets, Protect Our Own* accurately summarises its role which is to provide the ADF and Government with foreign Signal Intelligence (SIGINT) as well as advice and assistance on information and communications security.

The operational environment for ASD is increasingly becoming that of cyberspace, consisting of the Internet, telecommunications networks, computer systems and embedded systems and controllers. The rate of technology progress and uptake is resulting in an operational environment that is complex, contested and globally accessible; and a threat landscape that is highly diverse, variable and rapidly evolving.

To fulfil its role, ASD provides:

- SIGINT collection and analysis capabilities from a wide range of sources.
- A unique insight into critical issues of the day and emerging strategic developments in support of military and strategic decision making.
- High-level security advice and services to Government to protect critical Government networks and infrastructure against cyber threats.

Focus Areas

ASD and DST Group have jointly developed and agreed on the following three focus areas for ASD's S&T strategic guidance:

- Network operations and access;
- Data science and analytics; and
- Cyber security

Important sub-elements that capture organisational functions and activities have been identified and are described in more detail in the classified strategic guidance document.[3]

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3   *Australian Signals Directorate – Science and Technology Strategic Guidance 2016–2026.*

The Defence Intelligence Organisation

Mission and Strategic Goals

The Defence Intelligence Organisation (DIO) is the strategic-level, all-source intelligence assessment agency for Defence. Its role is to provide independent intelligence assessment, advice and services, primarily to the Minister for Defence and the Australian Defence Organisation, and to support the Defence mission: Defending Australia and its national interests.

DIO supports the planning and conduct of ADF operations; Defence policy, planning and decision-making; the development and sustainment of Defence capability; and wider Government planning and decision making on Defence and national security issues.

To fulfil its role, DIO provides:

- Assessment, advice and services to support the planning, command and conduct of current and potential operations by the ADF.
- Timely assessments of the interests, posture, policy, intent and capabilities of countries and foreign non-state actors relevant to Australia's security and strategic environment, including technical assessment of weapons systems, cyber threats and defence-related technologies.
- Specialist advice to support Government strategies in counter-proliferation and combatting terrorism.

Focus Areas

The following science and technology focus areas address current and future intelligence challenges.

- Technical intelligence;
- Counter-proliferation and counter-terrorism;
- Intelligence mission data; and
- Advanced analytics capability

DST Group, in partnership with DIO, continues to develop a strategically prioritised, robust, harmonised and mutually dependent intelligence research and development program that is aligned with FVEY S&T activities. A detailed description of these focus areas is provided in the classified strategic guidance document.[4]

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4   *Defence Intelligence Organisation – Science and Technology Strategic Guidance 2016–2026.*

Delivering Science and Technology

DST Group is the national leader in the S&T for safeguarding Australia by delivering valued scientific advice and innovative technology solutions for Defence and national security. Its core roles are centred on providing expert and impartial advice and support to the conduct of operations, for the current force and for the acquisition of future Defence capabilities. See Figure 2 below.

DST Group focuses its research on areas where it has extensive, unique domain knowledge and science and technology excellence, and where Defence must retain a sovereign capability. DST Group strategy emphasises the essential role of external partnering to strengthen its ability to integrate knowledge and innovation for Defence and national security capabilities.

DST Group accesses and leverages world leading science, technology, knowledge and innovation through collaboration with industry, academia and international agencies. DST Group works closely with these partners in order to provide quality advice and innovative solutions for Defence and national security.

Figure 2 – Representation of the roles of DST Group with support to operations at its centre.
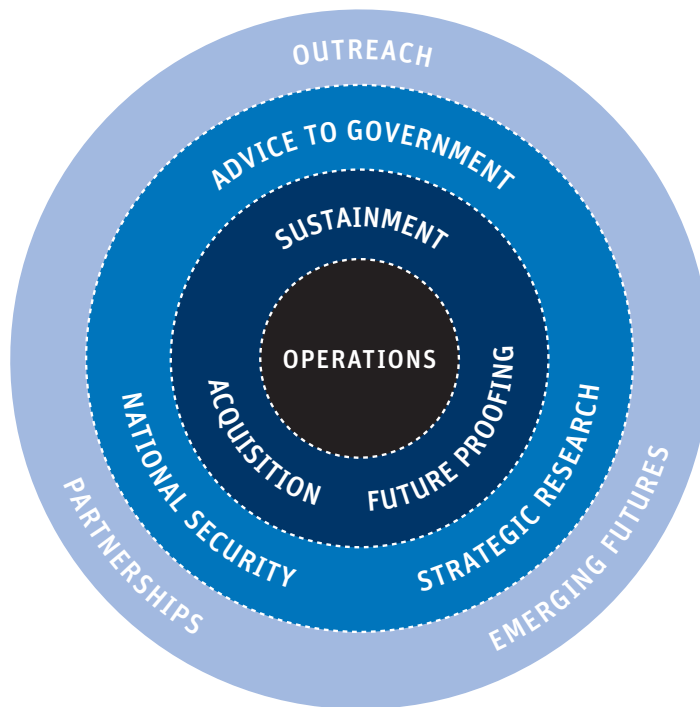
Acronyms

ADF	Australian Defence Force		FPR	First Principle Review
AGO	Australian Geospatial-Intelligence Organisation		FVEY	Five-Eyes
ASD	Australian Signals Directorate		GEOINT	Geospatial-Intelligence
DIA	Defence Intelligence Agency		SIGINT	Signal Intelligence
DIO	Defence Intelligence Organisation		S&T	Science and Technology

For further information
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